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ABSTRACT

This plan for the integration of technology into the curriculum of Idaho public schools presents eight goals for the state's public schools: (1) Integration--to improve the quality and effectiveness of classroom instruction and learning for all learners by integrating technology-based resources in conjunction with state curriculum guides; (2) Compatibility--to ensure the compatibility of technology-related equipment to facilitate a comprehensive statewide network system; (3) Collaboration with Colleges of Education--to facilitate collaboration in the preparation and training of inservice teachers for integration of technology into instructional practices; (4) Community Collaboration--to encourage the collaboration of schools, libraries, community members, state agencies, organizations, businesses, industries, and postsecondary institutions to meet the needs of all learners; (5) Technology Systems--to create secure technology systems that enhance the efficient operation of schools; (6) Evaluation--to plan, evaluate, and publicize the impact of technology on teaching, learning, resource utilization, and the efficient operation of schools; (7) Student Training--to train students in the installation, maintenance, and support of technology systems; and (8) Systems Support--to provide district- wide support structures for training and for the installation, maintenance, and support of technology systems. Each goal is followed by a vignette illustrating its application, a statement of the impetus for the goal, and objectives and methods to help achieve the goal. Appendices include: Legislative Charge (by Catriona Ayer); Info Tech '96 Recommendations; Idaho Council for Technology in Learning (ICTL) Guidelines; public meeting input graph; sample classroom configurations; legal issues in technology and acceptable use policy; information for creating and supporting networks; and a glossary of terms. (SWC)

Connections:

A Statewide Plan for Technology in Idaho Public Schools

Published By:
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State Superintendent of Public Instruction
Idaho State Department of Education
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Connecting Students, Teachers and Technology

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DR. ANNE C. FOX
STATE SUPERINTENDENT
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May, 1996

We live in exciting times. Advances in educational technology are changing the landscape of teaching, and Idaho is poised to take full advantage of these changes. From the Internet, which will connect our students and teachers to other students and teachers around the world, to compressed video conferencing, which will enable learners to take classes that would otherwise be unavailable, technology is advancing education for all learners.

This report, compiled from the input of hundreds of Idahoans, the Idaho Legislature, the Idaho Council for Technology in Learning, business, industry, teachers, administrators, students and many others, sets the course for the next century in education technology. It is a blueprint for action.

The findings of this report indicate that Idaho must continue to give strong support to technology in education. Technology is becoming more and more ubiquitous in the classroom and in administrative offices, and our schools are relying on Idaho to continue to provide adequate funding to ensure that our students are among the best prepared in the nation. Our children deserve no less.

It is my pleasure to present **Connections:** A statewide Plan for Technology in Idaho Public Schools.

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Vision

Vision

Idaho will forge a new and powerful model of education, ensuring a bright future for her students. Idaho schools will be places where students are motivated to learn with the help of quality instruction and leading-edge technology. Students will graduate with the knowledge and tools they need to compete and excel in an increasingly technology-based world.

Families, communities and educators will come together to prepare knowledgeable citizens for the world of tomorrow. Society will be enriched as everyone contributes to his or her own well-being and that of others.

Idaho commits itself to this vision for her future and the future of her children.

Mission

Mission Statement

The mission of this plan is to promote a thorough system of education by providing a framework for school districts, the public and partner agencies for the integration and use of technology in Idaho's public schools, which will enable students and educators to achieve their highest potential.

Executive Summary

The Idaho Council for Technology in Learning, the Idaho State Board of Education and the Idaho State Department of Education present this plan, **Connections:** A Statewide Plan for Technology in Idaho Public Schools, to the citizens of the state of Idaho. This plan presents a framework for the integration of technology into the curriculum of Idaho public schools.

Representing the input of hundreds of Idahoans, the ICTL, the State Board of Education, the State Department of Education, teachers, students, parents, business, industry and the state's institutions of higher education, this plan is the result of the 1994 Technology Initiative enacted by the Idaho Legislature.

Connections presents eight goals to the state's public schools. Additionally, each goal is followed by a *Vision of Tomorrow*, a vignette illustrating the application of the goal, and a *Goal Rationale*, which states the impetus for the goal.

Following the vision and rationale are *Objectives* and *Recommendations for Success*. The objectives provide a method to help achieve the goals, and the recommenda-

tions provide methods for achieving the objectives.

Additional support material (including a glossary of terms) can be found in the appendices.

Technology planning is critical to the success of the 1994 Technology Initiative and for the successful integration of technology into the curriculum. As the world moves toward a more information-based, technologically-oriented society, Idaho is poised to take a leadership role in educational technology and its use in the teaching and learning process.

The Goals

1. **Integration -**
   To improve the quality and effectiveness of classroom instruction and learning for all learners by integrating technology-based resources in conjunction with state curriculum guides.

2. **Compatibility -**
   To ensure the compatibility of technology-related equipment to facilitate a comprehensive statewide network system.

3. **Collaboration with Colleges of Education -**
   To facilitate collaboration with Colleges of Education in the preparation and inservice training of teachers for integration of technology into instructional practices.

4. **Community Collaboration -**
   To encourage the collaboration of schools, libraries, community members, state agencies, organizations, businesses, industries and postsecondary institutions to meet the needs of all learners.

5. **Technology Systems -**
To create secure technology systems that enhance the efficient operation of schools.

6. **Evaluation -**
To plan, evaluate and publicize the impact of technology on teaching, learning, resource utilization and the efficient operation of schools.

7. **Student Training -**
To train students in the installation, maintenance and support of technology systems.

8. **Systems Support -**
To provide district-wide support structures for training and for the installation, maintenance and support of technology systems.

History and Perspective

Overview

Idaho has been a leader in technology planning, even as the process of education has changed rapidly. Tremendous strides in planning, purchases and integration have moved the state ahead of many of its neighbors. While significant progress has been made, the process of technology planning is an ongoing effort, requiring the commitment, cooperation and coordination of the state, the public, school districts and the private sector.

The Roots of Technology Planning

Technology planning in Idaho began in earnest in 1990 when then Governor Cecil Andrus commissioned a special task force to formulate a strategic telecommunications plan for the state. The task force comprised a wide-range of interested parties, including representatives from the Idaho Legislature, private industry, state libraries, public television, the Department of Education, and others.

The task force convened in December of 1991 to create a set of guidelines for the networks, equipment and telecommunications services that shuttle information through the state. This effort resulted in the publication of *Telecomm '92: Connecting Idaho to the Future*, which was adopted by the state legislature in 1993, and created the Idaho Technology Advisory Council (ITAC) which was charged with

implementing the plan outlined in the *Telecomm '92* report.

The report made several suggestions designed to guide Idaho through the technology revolution, emerging as a national leader in telecommunications and telecommunications infrastructure.

Concurrent with the task force that created Telecomm '92, the Statewide School Facilities Needs Assessment Committee (SSFNAC) performed a comprehensive assessment of school facilities. Completed in 1993, the study determined that Idaho Schools required significant funding to be brought up to the SSFNAC minimum standards.

In 1995, recognizing that advances in technology have surpassed the vision and scope of *Telecomm '92*, Governor Phil Batt created the Info Tech '96 Council to review and update the recommendations of *Telecomm '92*. Info Tech '96 was charged with reviewing and updating the objectives and strategies of the original *Telecomm* report, and to recommend actions to realize the conclusions of the new report.

As part of its findings, Info Tech '96 dissolved ITAC and created the Information Technology Resource Management Council (ITRMC), which will make recommendations for technology planning for state agencies. The purpose of this Council was to improve the efficiency and productivity of government. In addition, Info Tech '96 also recommended the creation of a Management of Information Technology Resources unit (MITR). MITR's function is to gather and collate an inventory of existing state information resources, develop a resource management plan, and coordinate and facilitate implementation of the state's technology plan under the direction of ITRMC.

Info Tech '96 established two goals for education:

1. The (Idaho) State Board (of Education) will:

   Coordinate information technology among all the educational entities.

   Provide a mechanism by which these technologies can be coordinated with entities outside education, and;

2. Use information technology to improve the quality, availability and efficiency of Idaho public education for children and adults.

Idaho's public schools will benefit from the efforts of Info Tech '96 and ITRMC, which will make telecommunications more affordable for individual districts. Schools will benefit from the implementation of statewide purchase agreements in the areas of hardware, software and telecommunications connectivity.

In the spirit of the Federal Telecommunications Act of 1996, the Idaho Public Utilities Commission is currently reviewing all state regulations in regards to telecommunications costs to Idaho public schools and libraries. $4 million will be distributed to selected schools in 1996 for technology upgrading.

Funding for Public Education and Technology

The Idaho Legislature enacted the Idaho Technology Initiative of 1994 which allocated $3.4 million in ongoing funds and $7 million in onetime monies to Idaho schools for the procurement of and training in, advanced educational technologies. "The State of Idaho recognizes the importance of applying technology to meet the public need for an improved and thorough public education system for both elementary and secondary education, post secondary education and

higher education and public libraries," (Idaho Code Section 33-4802 [1994]).

Under the Technology Initiative, the Governor appointed the Idaho Council on Technology in Learning (ICTL), a 15-member council consisting of the State Superintendent of Public Instruction, four legislators, and representatives of various state educational agencies which distributed the technology monies to the districts through a grant process.

Utilizing the information from the 1992 Telecommunications report, the council has created eight goals for technology in public education. Those eight goals, which address the issues of integration, compatibility, community and higher education collaboration, technology systems, evaluation, student training, and system support serve as the centerpiece of this plan.

With a portion of the $10.4 million school technology money, the 1995 Idaho Legislature voted to set aside part of the public school appropriation for Council expenses including permanent staffing through the Idaho State Department of Education's Technology Center.

With the continued support of the Idaho Legislature, the council is in its third year of operation and will distribute $10.4 million to Idaho public schools and $1 million to Idaho's colleges and universities in 1996. To date, the council has distributed more than $30 million to Idaho schools for technology.

District Planning

Under the direction of the ICTL, 111 of Idaho's 112 school districts have created and implemented district-wide technology plans. These plans are designed to meet the eight goals of the ICTL, as well as direct the district's technology

efforts. Results from these expenditures showed 48.88% of the money spent on computers, 21.59% in network related expenditures, 7.87% in software, 5.96 in salaries and benefits, 3.94% in peripherals, 3.82% in purchased services, 2.2% in supplies and materials.

With nearly half of all funds going to new computer purchases, Idaho has lowered its student-to-computer ratio from 25.7 to one in 1990, to 8.2 to one in 1996. This translates into more than 20,000 more computers in Idaho's classrooms, and puts Idaho ahead of the national average. Future plans indicate that more resources will be spent on training and software purchases than in the past.

This plan is a reflection of local district planning efforts, which legislative mandate requires to have been revised and updated each year since 1994.

Developing a State Technology Plan

Technology planning in Idaho has been occurring since 1990 -- four years before Congress approved a measure to encourage all states to begin the process.

On March 31, 1994, the President of the United States signed into law the Goals 2000: Educate America Act (Public law 103-227). Funding from this Act was designated to assist state educational agencies to formulate and implement state improvement plans, and promotes technology as one of the tools for educational reform.

In November 1994, then Idaho State Superintendent of Public Instruction Jerry Evans applied for a school improvement grant under Title III of the Educate America Act. Idaho was awarded a grant, and $75,000 of the grant was designated for the development of a statewide technology plan for Idaho's public schools.

In October of 1995, Superintendent of Public Instruction Anne C. Fox toured the state to receive public input on the direction of strategic planning for Idaho. Meetings were held in Boise, Nampa, Idaho Falls, Pocatello, Twin Falls, Lewiston and Coeur d' Alene with more than 500 citizens, teachers, administrators and business persons attending. The input from those meetings, as well as the eight goals of the ICTL, serve as the starting point for this plan.

This plan is the result of that funding and the input of hundreds of Idaho citizens, educators, business persons, the Idaho Council for Technology in Learning, the State Board of Education and other interested parties.

Technology and Education in the Next Century

Students

Students should have access to an array of electronic capabilities. Student applications will have varying degrees of sophistication, depending on grade level and individual student progress. In general, all students should be able to perform the following functions, although actual implementation will vary in a way appropriate to student level:

- All students shall have adequate access to the tools of technology;
- Receive assignments and examinations from the teacher electronically;
- Receive study materials from the teacher electronically;
- Use technology tools to solve problems in all subject areas;
- Use computers to access a variety of educational materials and databases;
- Employ technology tools for word processing, spreadsheets, multimedia and telecommunications;
- Carry out assignments and examinations on computer study station;

- Receive tutoring and drill from instructional software, which should be adapting to the individual student's needs;
- Send E-mail and navigate the Internet.

Teachers

Teachers should be able to use educational technology tools to perform the following functions:

- Know how to adapt traditional lesson strategies and content to a technology supported format;
- Acquire educational materials in electronic form, using a menu of suitable electronic databases, organized by academic subject, grade and level of difficulty;
- Develop lesson plans incorporating material electronically retrieved;
- Transmit these materials electronically to students;
- Monitor and control student access to remote electronic materials to assure that educational objectives are attained and district resources are used wisely;
- Develop and conduct appropriate tests of student progress and maintain records of student performance;
- Maintain records electronically on all students in the class;
- Know how to use technology tools and to adapt them to the teaching/learning process;

- Update and report these records to the administration at appropriate intervals;
- Communicate student progress to students and parents at regular intervals;
- Communicate electronically, through e-mail and other means, with other teachers and networks that are professionally relevant.

Administrators

Technology should support the administrators in each school and at district headquarters, with all of the capabilities available to teachers, students and parents, as well as the additional capabilities essential for administrative responsibilities. Specifically, administrators should be able to do the following:

- Maintain student records for planning, budgeting, reporting and performance monitoring for academic and administrative purposes;
- Maintain some personnel records on teachers for management purposes that do not violate confidentiality;
- Address the specific electronic materials that can be accessed by teachers and students;
- Maintain records and other information on the curricula, use of electronic educational resources therein and related academic activities at all grade levels;
- Prepare and distribute on all the above to other administrators in the district and elsewhere, as management needs require;

- Make cost-efficient purchases of hardware and software.

Surveying the Landscape

Increasingly, computers are finding their way into every occupation from doctor to dock worker. As a result, the need to prepare students for the world of tomorrow is more imperative than ever before. Knowledge of technology and technology systems will be as important to today's students as the "four Rs" were a generation ago. Additionally, this knowledge can be applied across the curriculum, from math and science to social studies and health class. The goal, then, is to give students exposure to technology in all subject areas.

The revolution in technology is in full swing, and educational needs have changed drastically. In order to keep up with technology and the needs of students, significant changes in all curricular areas need to be addressed.

Integrating computers into the classroom and into all curricular areas will expand learning opportunities for all students, and open the doors for many nontraditional learners. However, care must be taken to assure that technology does not widen the gap between advantaged and disadvantaged, males and females, majority and minority students. To accomplish this, there are some questions that educators must ask:

- What effect will widespread use of technology have on teaching basic skills?
- What effect will widespread use of technology have on teaching methods?
- What effect will widespread use of technology have

on curriculum?

- What effect will widespread use of technology have on evaluation?
- What effect will widespread use of technology have on the need to train students?
- What effect will widespread use of technology have on the technology systems themselves?
- What effect will widespread use of technology have on budgets?

Educators need to address these questions and more before the effective use of technology can be realized in Idaho's schools. This plan addresses those questions, and sets a fundamental framework that will help guide Idaho's public schools into the next century.

Effective integration of technology should be based on the following principles:

- The Idaho Legislature must make a commitment to continued funding for technology in education;
- Technology should be integrated into the curriculum with an orderly and well-defined technology plan;
- Sufficient resources to support staff development, curriculum development, software and hardware acquisition need to be secured;
- All learners must have equal and adequate access to the tools of technology;
- Districts must make a commitment to developing fundamental technology skills for all learners and educa-

tors;

- Technology should support instructional management;
- Technology should allow teachers to concentrate on student needs and to become more effective facilitators of learning;
- Technology should be seamlessly and invisibly woven into the fabric of education;
- Technology tools should be made available in sufficient quantity to allow all students to develop basic skills;
- Districts should be aware of the ever-changing nature of technology, and plan accordingly.

Goal 1

Integration:

To improve the quality and effectiveness of classroom instruction and learning for all learners by integrating technology-based resources in conjunction with state curriculum guides.

Vision of tomorrow:

Tanya is a senior in high school, and very restless. Her history teacher, Ms. Jones, has assigned Tanya's class a report on the history of mining in Idaho, but Tanya's thoughts are on graduation and on deciding which college she will attend. Putting those thoughts aside for the moment, she turns her attention back to her assignment.

On the viewscreen in front of her, Tanya can see the data Ms. Jones is presenting to the class. Flipping between a video of current mining techniques (Tanya finds the sound of the drill going through the rock reminiscent of a dentist's drill) and a three-dimensional spreadsheet of mining production, Tanya listens to Ms. Jones outline the parameters of the assignment.

Tanya has decided to focus her report on the personal lives of miners and their families during the pioneering days of the late 1800's. She wonders what life was really like for them, what kind of hardships they had to overcome, what

kind of rewards they received for their struggles.

Later that week, Tanya creates a database of all of the known writings of the people she is studying. She has located several personal journals and diaries as well as letters and business documents. She downloads all of the information and begins to select parameters for her report.

Tanya performs several search routines, looking for commonalities and themes. She is surprised by her results. She had expected to find a lot of references to the hardships and difficulties of daily life, but instead discovers that the writings she is reviewing (nearly 4000 pages in all) are full of hope and vision. Tanya is impressed with the writing of one woman in particular, a mother of five, Virginia Birum.

Curious about Virginia, Tanya accesses several genealogy databases and discovers that the great, great granddaughter of Virginia Birum still lives in Idaho. That evening, Tanya sends an E-mail to the great, great granddaughter, asking for more information about Virginia.

Virginia Birum's family is thrilled to help Tanya and, armed with old photos of Virginia, some video clips of the family and even a sound file of Virginia Birum's great, great, great granddaughter (now two), Tanya begins to work on her report.

Three weeks later, Tanya is finished. A final keystroke, and the entire report is downloaded to her teacher's electronic drop box. That night, Ms. Jones uploads Tanya's report from home. She is impressed, and E-mails Tanya a quick note, telling her what a splendid job she has done.

Goal Rationale:

The use of technology in society is increasing exponentially. As this shift occurs, the members of society need the knowledge and skills to use technology effectively.

As Idaho schools move into the 21st Century, educators face new challenges and new opportunities. In 1990, there were fewer than 8,500 computers in Idaho's classrooms. By 1995 that number had risen to nearly 30,000. In 1990, there was an average of 26 students per computer, today it is 8 students per computer. These changes are reflective of transformations throughout the community and the state. More and more businesses and homes are using technology to be more efficient and to connect with the rest of the world.

The challenge is to seamlessly and invisibly weave the fabric of technology into curriculum and to maintain adequate funding levels; the opportunity is to use the tools of technology to enhance the learning process, and to produce technologically skilled students.

In addition, schools are more interconnected than they ever have been before. The use of networks (both LANs and WANs) and internetworks (such as the Internet) has skyrocketed. The challenge is to maintain theses complex systems; the opportunity is to increase efficiency in teaching and administration.

Objective A:

Districts will create and implement a technology plan focused on increasing learning.

Recommendations for Success:

- Use of technology should be driven by and integrated into the curriculum.
- Develop guidelines for district technology plans.
- Maintain a district curriculum planning committee composed of administrators, teachers, parents, students and local businesses that makes recommendations on technology.
- Review and refine technology plans annually and reassess technology needs if necessary
- Funding from the ICTL will be predicated on districts completing a technology plan.
- Include in the plan strategies that outline how to use learning technology in the classroom.
- Provide technical assistance to districts through the State Department of Education and Regional Technology Advisors on the appropriate utilization of technology in the classroom.
- Assessment and evaluation of needs should be a continuing part of district technology plans.
- Needs assessments should address at least the following:
  - Staff development;
  - Student training;
  - Software review and implementation;
  - Curriculum integration;
  - Ongoing facility planning;
  - Hardware obsolescence;
  - Interconnectivity/telecommunications issues.

Objective B:

Specific technology competencies and benchmarks will be part of the state's curriculum guides, which will define what students are expected to know and be able

to do with technology tools.

Recommendations for Success:

- Coordinate, through the State Department of Education, with the Colleges of Education and the State Board of Education to establish curriculum integration guidelines noting appropriate technologies for specific instructional purposes.
- Update, as a function of the State Department of Education, technology competencies and benchmarks as technology evolves.
- Continue, as a function of the ICTL, to provide ongoing coordination, management, policy recommendations, and accountability for curriculum integration.

Objective C:

Districts will provide the necessary support for the integration of technology into the curriculum:

Recommendations for Success:

- Integration of technology into the curriculum should include the following:
  - Integration into all curricular areas and instructional settings;
  - Make use of appropriate technologies in all teaching and learning environments should ;
  - Provide all students with tools for learning;
  - Accept work from students in a variety of formats, including electronic media;
  - Technology integration should be sup-

ment opportunities;
- Technology skills should be integrated into the curriculum of all subjects.

- Model and be familiar with the benefits of effective technology use. Successful integration of technology requires a change in the traditional roles of teachers and students -- teachers become facilitators and students become active participants.
- Provide effective, on-going technology inservice opportunities to all staff and faculty to teach integration strategies and pertinent classroom management techniques.
- Provide, through the Curriculum/Technology Center and Regional Technology Advisors, training opportunities in curriculum integration strategies to local districts.
- Create, as a function of the State Department of Education, a database of curriculum integration resources.
- Provide for cooperation between the Curriculum/ Technology Center and Bureau of Instruction staff to train curriculum area specialists in the integration of technology in their subject areas.
- View integration of technology and curriculum as a process, not an event.

Objective D:

Identify technology skills that should be mastered by all teachers, administrators, staff and volunteers.

Recommendations for Success:

- Identify technology skills through collaboration with the State Department of Education, Colleges of Education, business, parents and edu-

leges of Education, business, parents and educators.
- Provide inservice opportunities.

Objective E:

Integrate the use of technology into school reform and restructuring efforts.

Recommendations for Success:

- Align curriculum reform efforts with technology integration standards embraced by national subject leadership organizations such as NSTA, NCTM, NCTE, ISTE and others.
- Promote intellectual curiosity, cooperative learning, analysis and synthesis of information, interdisciplinary learning and improved communication skills.
- Review school improvement plans and seek methods for leveraging technology as a school improvement tool.
- Use information from the State Department of Education on how technology supports school reform and improvement.
- Provide sustained support and cooperation from all levels of administration to achieve successful technology integration into the curriculum.
- Increase flexibility by allowing demand, need and opportunity to dictate schedules.
- Disseminate Idaho success stories via the State Department of Education's web page.

Goal 2

Compatibility:

To ensure the compatibility of technology-related equipment to facilitate a comprehensive statewide network system.

Vision of Tomorrow:

Ms. Juarez is the superintendent of a small, rural school district. For the past year, she has been working with two neighboring districts to provide an alternative high school that the three districts will share, and she and the other two superintendents are meeting to discuss some of the final plans.

As she slightly adjusts her monitor, she notices that the packet of data she has been waiting for is coming through.

"This is just what I needed," she says to the other two superintendents displayed on her screen. "I'll cross-correlate this with my data and send you the results in a few minutes."

The data she received is a listing of student records that she is integrating with her own records to determine which students will be eligible to attend the new school. As the other two superintendents discuss bussing schedules, Ms. Juarez reflects on the changes she has seen in the years she has

been in education.

When she came to the district, the schools had only a handful of computers, and the students seemed to know more about the systems than the teachers. Now she is connected to every district in the state and can teleconference with her colleagues across the nation. Reporting district data now takes a few seconds, and she has instant access to an almost inexhaustible supply of information. A beep tells her that the cross-correlation is complete, and she returns to her task.

"Here is the final roster," she tells the other two. "I'm sending it to you now and you should be able to download soon. As soon as we can finalize the schedules, I'll upload the information to the State Department of Education. I think we are almost there."

The trio of superintendents finish their conference and each logs off. Proud of what they are accomplishing, Ms. Juarez sends an E-mail to her new principal, letting him know that his school is nearly ready.

Goal Rationale:

Rapid communication and the ability to retrieve and synthesize vast amounts of data are essential aspects of technology in the 21st Century. In order for Idaho schools to maintain efficiency in the Information Age, districts need to be able to effectively communicate with each other and with the rest of the world. Comprehensive, district wide, interoperable networking systems will facilitate communication and save districts money.

Idaho has no statewide electronic network for educators. Many school districts are equipped with local network sys-

tems that are not interoperable with other district-wide network systems, and many more have no district networks at all. In addition, many districts lack personnel trained to install and support large networks. Clearly, these issues need to be addressed.

Diligence must be practiced to ensure continued funding for networks and network related items for school districts that are interoperable with the district's needs. In addition, state agencies and local districts must partner to reduce telecommunications costs, and to provide suggested guidelines to ensure that all districts can follow.

Objective A:

Develop and distribute technology, hardware, software and networking compatibility guidelines through a statewide collaborative effort.

Recommendations for Success:

- Predicate guidelines on industry standards, not vendor standards.
- Provide network interconnectivity that will enable effective, efficient and unduplicated networking services in cooperation with the State Department of Education, the State Board of Education, state institutions of higher education, the State Board Telecommunications Council, ITRMC and other state agencies.
- Monitor emerging technologies that will benefit education.

Objective B:

School districts should provide publicly accessible telecommunications information resources.

Recommendations for Success:

- Explore, on an ongoing basis, methods for reducing telecommunications costs by the State Department of Education in cooperation with the PUC and Department of Administration.
- Provide, as a function of the State Department of Education, technical assistance to school districts for Internet connectivity.
- Research and compile a recommended list of local, state, and national Internet connectivity options to be disseminated to districts via the State Department of Education web page.

Objective C:

Establish, via statewide collaborative effort, suggested guidelines for acceptable hardware and software use.

Recommendations for Success:

- Develop and provide additional professional development opportunities.

Objective D:

Districts will create networks (WANs and LANs) that will serve their intranetworking needs, and will connect to the public switched network.

- Implement, wherever possible, district-wide WANs to link campuses with the district office.

Objective E:

State agencies, in coordination with ITRMC, will provide assistance in the design, installation and purchase of equipment that will support Interconnectivity through the public switched telecommunications network.

Recommendations for Success:

- Cooperation between the State Department of Education, State purchasing and the ITRMC will identify and negotiate pertinent purchasing agreements.

Goal 3

Collaboration with Higher Education:

To facilitate collaboration with Colleges of Education in the preparation and inservice training of teachers for integrating technology into instructional practices.

Vision of Tomorrow:

Mr. Higheagle, a 7th grade science teacher and Dr. Johanson, a university science methods instructor, are working together to enable Dr. Johanson's preservice students the opportunity to participate in a realistic mini-lesson presentation via video conferencing while giving Mr. Higheagle's students a lesson in science.

Dr. Waters (from the university's geology department) will conduct a 40-minute lesson on the hydrologic cycle for Mr. Higheagle's class from the university classroom. Dr. Johanson's students at the university will have the opportunity to participate in the large-group, multimedia presentation.

Mr. Higheagle's students are excited. For the past week they have been creating computer models of simple weather systems and learning about evaporation, condensation and precipitation. Mr. Higheagle is pleased to see such enthusiasm

for science from his class.

That Friday, with Mr. Higheagle and his class in their classroom and Dr. Johanson and his students in the university classroom, Dr. Waters proceeds with her lesson. Using video, computer-aided interactive graphics as well as a teapot and Bunsen burner, Dr. Waters delivers the lesson.

Afterward, all three agree the collaborative effort had been a success. Dr. Johanson's students received a hands-on look at lesson presentation, Mr. Higheagle's 7th graders learned more about how the earth works, and Dr. Waters did what she likes best -- teach.

Goal Rationale:

The Colleges of Education in Idaho have a key role in preservice education and have the responsibility to provide professional development to teachers in technology.

With the integration of computers and their related technologies into the classroom, the teacher now must become more knowledgeable and be able to use technology in the classroom.

Currently, Idaho's colleges and universities are taking measures to prepare tomorrow's teachers. Basic skills in technology are a regular part of obtaining a teaching degree from an Idaho institution. In addition, however, the state's colleges and universities must also provide inservice courses for established teachers, many of whom saw their first computer long after receiving their degree.

Local school districts, the State Department of Education, the Idaho legislature and the state's colleges and universities

must work together to ensure that Idaho has the best trained and knowledgeable teachers available.

Objective A:

Educational entities will collaborate in the development and delivery of professional development opportunities.

Recommendations for Success:

- Continue to provide financial support for teacher education from the ICTL.
- Coordinate inservice efforts through the Curriculum Technology Center.
- Provide inservice opportunities with the assistance of the Colleges of Education.
- Continue regional technology advisors' work with all of the districts to identify technology inservice and consulting needs..
- Provide, at the district level, opportunities for professional development.

Objective B:

Colleges of Education will assume a leadership role in the development and delivery of preservice teacher education in technology.

Recommendations for Success:

- Incorporate the use of technology in all preservice education classes and encourage the incorporation of technology in all university courses.
- Insure, through the Colleges of Education, that all teachers be able to use and integrate technology into the classroom.

- Survey the districts, in conjunction with the State Department of Education and the Colleges of Education, to determine the areas of need and interest .

Goal 4

Community Collaboration:

To encourage the collaboration of schools, libraries, community members, state agencies, organizations, business, industries and postsecondary institutions to meet the needs of all learners.

Vision of Tomorrow:

Gerald is thirty-six and a single parent. He works hard as an electrician to support his family, but realizes that if he wants a promotion at work to provide a better standard of living for his family, he needs more education.

His boss is supportive, and agrees to pay for a portion of Gerald's continuing education - after all, Gerald and several others from the company wired the school's network (at no charge), and he realizes that by helping Gerald, he is helping himself and his company as well.

Through the local high school, Gerald is able to take distance-learning classes via compressed video. This is a great benefit, since he is nearly 100 miles from the nearest college. Gerald also takes classes over the Internet, which he accesses at the local library on machines that were donated by local businesses and other members of the community.

Gerald's children are proud of what he is doing, and their classwork has improved as a result of watching their father put such an emphasis on education. Gerald is proud too, and is thankful for the opportunities that have been made available to him. These days, after the dinner dishes are put away, the entire family spends the evening doing homework.

Always a believer in contributing to the community, Gerald's boss is pleased to see the practical results of his efforts, and those of others.

In a little less than a year, Gerald completes his course work and receives the promotion he has been working for. But Gerald continues to go to the library two nights per week, this time as a volunteer tutor, teaching a forty-year-old father of five how to read.

Goal Rationale:

Educating children is everyone's responsibility. It takes a whole community to educate a child, and that community is changing.

With the emergence of new technologies, the very concept of "community" has transformed as the use of telecommunications technology ties together partners in education without concern to distance and time. The impact of this revolution is just now being felt, as schools, libraries, businesses, postsecondary institutions and others come together to help educate Idaho's learners.

Local districts are encouraged to develop partnerships with other concerned parties to ready our learners for the world of tomorrow, and in many cases, this is already happening.

Currently, some districts have entered into purchasing agreements with other districts and the private sector to make the

tools of technology more accessible to students and the rest of the community. In some instances, the State Department of Education has been able to link smaller districts together, giving them more purchasing power.

The state's colleges and universities are currently offering distance learning opportunities to local districts, giving students a leg-up on their education, and adult learners the ability to take classes they might not otherwise be able to take.

The Idaho legislature has invested in developing collaborative efforts between districts and other agencies, and is encouraged to continue.

Objective A:

Encourage collaboration between school districts and local libraries to allow community access to technology during and after school hours.

Recommendations for Success:

- Develop a long range plan for telecommunications connectivity at all local libraries.
- Develop a long-range plan for a statewide intra-library telecommunications infrastructure.
- Collaborate with local libraries to share resources and technology when needed.

Objective B:

Encourage school districts and libraries to make technologies available to adult learners during after school hours.

Recommendations for Success:

- Encourage districts to provide the necessary resources to enable media centers and other technology resources to be made available after regular school hours.
- Encourage districts to develop partnerships with local adult literacy providers to facilitate the use of technology by adult learners.
- Use the Department of Employment's website to obtain information on available jobs and salaries.
- Collaborate with colleges of technology to provide upgrade and customized training for industry.

Objective C:

Each district will facilitate community collaboration as part of their long-range technology plan.

Recommendations for Success:

- Develop guidelines for community collaboration in cooperation with local public service organizations, local governments and state agencies and private industry.

Objective D:

Educational entities will work with the Department of Administration, business, industry and telecommunications providers to assist in procuring programs and negotiating purchases that are beneficial and cost-effective to every district.

Recommendations for Success:

- Work with ITRMC and State Purchasing to identify and successfully negotiate pertinent purchasing agreements.
- Continue to pursue, as a function of the State Department of Education and the ICTL, beneficial relationships with state and national telecommunications hardware and software businesses.
- Pursue local relationships, at the district level, to identify and successfully negotiate pertinent purchasing agreements.

Goal 5

Technology Systems:

To create secure technology systems that enhance the efficient operation of schools.

Vision of Tomorrow:

Mr. Pike has been the elementary school's secretary for more years than he is willing to admit. The job has always been challenging, but he loves what he does, and the staff and students have always admired his efficiency and dedication (and the occasional homemade cookie).

Today is a day like most - a list of reports to file, messages to send to the teachers and scheduling for the principal. But unlike these days in the past, Mr. Pike now has a centralized network to assist him.

As he starts his day, he electronically files the previous day's attendance records in the district office. This is an easy task, since all of the teachers now report attendance through the school's local network. Grades are due today and he quickly downloads the information, again sending it directly to the district office.

In addition he has received an E-mail from the local college about a seminar on integrating video into the elementary

classroom. Mr. Pike edits the message down to the important details and forwards it to each teacher's terminal with a keystroke. He then calls-up the principal's schedule on his screen.

He quickly schedules a few meetings, and includes a reminder about the faculty picnic scheduled for Saturday. In less than an hour, he has completed work that used to take the better part of a day.

"Good morning Mr. Pike," is the cheerful greeting he gets from his principal.

"Here are your reports, calendar and messages," he replies, handing her a bulging folder.

"I don't know how this place would function without you Mr. Pike," is the reply.

Goal Rationale:

With the creation of efficient, and well-run technology systems, schools can function more effectively than ever before. The creation of WAN's and LANs, and the placement of computers and phones on each teacher's desk will assist in delivering information more rapidly and accurately, which will ultimately benefit learning.

Ten years ago, most local districts performed all of their reporting by hand. Attendance, grades and student records were all filed and tabulated by the time-honored method of pencil and file folder. Today, those same records are processed electronically. Timely access to information is critical to the effective operation of schools. Information which used to take hours, or even days to compile, now takes a few minutes.

Care must be taken to ensure the security of these systems, and districts are encouraged to provide professional and appropriate security solutions. These systems and security solutions require a commitment on the part of the Idaho legislature to continue adequate funding to the districts for these purposes.

Objective A:

Districts should create a network system that will:

- Include data compatibilities standards;
- Provide a mechanism by which teachers, administrators and students can send and receive e-mail;
- Provide centralized attendance reporting;
- Provide centralized grade reporting;
- Provide shared media services and centralized computer software support;
- Provide for shared file storage;
- Provide Internet access for teachers, administrators and students;
- Provide continued confidentiality.

Recommendations for Success:

- Review district technology plans and ensure that they incorporate networks in all of their campuses.
- Provide models and technical assistance to districts from the State Department of Education in the creation and maintenance of networks.
- District WANs should:
  - Provide the district with access to the business and academic records of each school;
  - Provide districts with a data collection mechanism for the reporting of information to the State Department of Education and the State Board of Education;

  - Provide cost-effective Internet connectivity;
  - Provide for future expansion of voice, video and data infrastructure.
- Investigate and implement software solutions to allow electronic district reporting.
- Publish recommended standards for connecting to State Department of Education from districts.

Objective B:

Create and maintain data compatibility standards.

Objective C:

Encourage districts to provide district-wide phone service that is accessible to every teacher.

Recommendations for Success:

- Assess the current state of telecommunication infrastructure in district buildings as part of district technology plans.
- Implement telephone access in every classroom to facilitate parent and community communication.
- Study the long-range effectiveness of combining district phone services as part of the overall district voice-data-video telecommunications infrastructure.

Objective D:

Provide and encourage access to media systems for the community, teachers, administrators, parents and students.

Recommendations for Success:

- Investigate and implement Internet connectivity in libraries.
- Make the media resources available to the community.
- Evaluate technology-based reference resources and implement appropriate models in cooperation with the State Department of Education.

Objective E:

School districts will ensure the security of the district computer networks to prevent unauthorized access to business and student records.

Recommendations for Success:

- Obtain technical support for the security of computer networks from the State Department of Education.
- Contract with hardware and software providers for up-to-date security solutions.
- Provide regular upgrades in virus protection software.

Objective F:

School districts will provide for the appropriate and secure use of the Internet by students, staff and administrators.

Recommendations for Success:

- Implement acceptable use policies that are designed to assure the appropriate use of the Internet by students, teachers, staff and administrators.
- Make use of Internet fire walls, proxy servers and blocking software.
- Review and provide district approved guidelines for Internet use, including:
  - Copyright laws;
  - Acceptable use policies;
  - Parental permission.

Objective G:

Districts will develop guidelines for cost-effective equipment selection, installation, networking and plant facility requirements.

Recommendations for Success:

- ICTL guidelines and industry standards information will be made available to districts.
- Develop interoperable models for districts through a cooperative effort of the State Department of Education and ITRMC.

Objective H:

Districts will define and develop distance learning resources appropriate to their needs.

Recommendations for Success:

- Develop telecommunications services for direct

and public-switched video conferencing access.

- Offer professional development on the proper use and implementation of various distance learning options.
- Investigate alternative distance learning opportunities.
- Publish a yearly summary of providers and delivery mechanisms from the State Department of Education.
- Identify distance learning needs as part of their local technology plans.
- Review curriculum and identify areas which could successfully be addressed by distance learning.
- Include distance learning opportunities as part of district technology plans.

Objective J:

School districts should provide systems security training for all staff.

Recommendations for Success:

- Review current security guidelines and provide professional development to staff.
- Use all passive and active security systems.

Goal 6

Evaluation:

To plan, evaluate and publicize the impact of technology on teaching, learning, resource utilization and the efficient operation of schools.

Vision of Tomorrow:

Helen is a graduating high school senior. Throughout her school career she was exposed to a wide array of technology and its use, including individual computer programs, multimedia technology, networking, peripheral technologies, data interfaces and much more. She and her classmates are members of the first class that has progressed through all grades using computer related technologies.

A host of people are curious about what kind of graduate she is. How have her teachers used technology in classroom environments? Has she acquired fundamental knowledge and skills in basic academic subjects? Has the use of various technologies accelerated her rates of learning? What uses of technology can she make for solutions of real life problems? Will any of her technology knowledge enable her to function better in the work environment or postsecondary education?

Helen, her teachers, school board members, community

members, business owners and other people want to know answers to these and other questions.

School personnel present data to show how Helen has used technology in learning, how her acquisition of basic skills was affected, what her current technology abilities are, what she has accomplished using technology and more. Further, these data are summarized across her class to show their collective achievements resulting from the use of technology.

Goal Rationale:

Technology has advanced so dramatically in recent years that it is pervasive in our society. Clearly, our youth will need technology knowledge and skills for their daily lives to succeed in the workforce. Further, most people believe the use of various technologies in the schools has the potential to powerfully affect teaching and learning.

Recognizing the need for and benefits of technology knowledge and skills, the legislature has appropriated resources for schools to acquire and use technology.

It is reasonable for citizens, educators and policy makers to inquire about a range of issues, from how technology resources have been used to what are the effects of using the technology in the schools. Without answers to such questions, decisions are made in a vacuum, and there is skepticism about the wisdom of allocating resources. But the answer to these questions will not be discovered without a plan and commitment to gather information. There needs to be an evaluation plan and design that extends across state and local levels.

Evaluation can occur at varying levels of complexity. It can occur simply, at the classroom level, as a part of daily in-

structional activity. But more difficult questions require more sophisticated and costly evaluation. If we want to know the difference between two types of instruction (one with and one without technology), we need to set up some form of experimental control.

The steps outlined in this plan should yield information that is useful to schools, the legislature, the ICTL, the State Board of Education, the State Department of Education and other interested entities in the results of using technology in the schools.

Objective A:

The ICTL, in cooperation with the State Colleges of Education, will design evaluation models for use by local districts.

Recommendations for Success:

- Identify quantitative and qualitative evaluation goals such as resource use, implementation of technology, efficiency and cost-effectiveness, student achievement, student productivity, student motivation and creativity, student attitude toward learning.
- Develop general evaluation models and specific evaluation designs that can be used by school districts, including personnel from the State Department of Education, Colleges of Education and school districts.
- Prepare packaged materials that describe in usable detail the evaluation models and design.

Objective B:

The ICTL, in cooperation with the state Colleges of

Education and the State Department of Education, will disseminate evaluation models to school districts and provide training in their implementation and use.

Recommendations for Success:

- Distribute to school districts information describing the recommended evaluation models and designs.
- Provide workshops for school district staff on the implementation and use of evaluation models.

Objective C:

The ICTL will support fiscally, and in cooperation with the state Colleges of Education and the State Department of Education, will collect and report annually on the implementation of technology in the schools and accomplishments resulting from its use.

Recommendations for Success:

- Instruct districts to select evaluation models, implement data collection procedures and collect data on implementation and results using technology in instruction.
- Encourage school personnel, parents and local board members to support a variety of approaches to assessing the use of technology.
- Provide common formats to schools for reporting results of technology assessment and evaluation.
- Report to the state information collected on implementation and results of using technology.
- Encourage districts to report data through electronic methods.

- Post summaries of school district evaluation reports on the home page of the State Department of Education.
- Prepare and submit an annual report from the ICTL to the legislature by January 1 of each year.

Objective D:

The ICTL, in cooperation with the state Colleges of Education and the State Department of Education, will commission selected studies of the implementation and results of the use of technology in schools.

Recommendations for Success:

- Identify specific evaluation objectives for which the ICTL would like specialized information.
- Provide requests for proposals to the State Department of Education, Colleges of Education and other educational entities to conduct studies to meet the specialized evaluation goals.
- Conduct the studies and report findings.
- Incorporate the findings of these studies in the annual evaluation of the use of technology prepared by the ICTL.

Goal 7

Student Training:

To train students in the installation, maintenance and support of technology systems.

Vision for Tomorrow:

Jeremy, Tina and Phil are just starting their junior year in high school and they are excited. They signed up for an innovative program called Technology Support and today is the first class. Their high school has been purchasing computers, modems, LCD panels and other types of technology over the past couple of years and has plans for installing a local area network.

While everyone has been excited about the new equipment, some problems have also surfaced: equipment doesn't get set up; teachers don't know how to get the equipment to work; and the teacher who has been assigned part time to supporting the new technology is overwhelmed with everything that needs to be done. On the other hand, the school has been looking for new opportunities to provide state-of-the-art technical programs for students to develop skills they will need to get a job.

The program Jeremy, Tina and Phil are starting addresses both of these challenges. They will learn how to install and

maintain computer equipment, networks, and video and multimedia equipment. Their laboratory for the hands-on experiences will be the equipment and networks being purchased and installed by the school. They will not only learn how to keep the systems running, but will provide the technical assistance needed by teachers and administrators. This will help them develop real-world skills in technology support as well as customer relations, teaching, problem solving, active listening, teamwork, data communication and the like.

This summer, Jeremy and Tina plan to work for a local contractor to install computer cables and connectors throughout the elementary school. They will get paid while they extend their learning opportunities.

Goal Rationale:

School districts have been provided the opportunity to install new technology systems in their schools but have to address the problem of how to best use the funding available to them.

Costs of installation and maintenance sometimes overshadow the benefits of the technology. Schools need to alleviate some of the costs by training students to perform some of these functions.

Students also need to be trained to serve as on-call support personnel for instructors and administrators to help with equipment or software problems.

Students need real life training opportunities to apply technical skills and to develop competencies which are required by industry.

Objective A:

Each district will include in their technology plan courses and opportunities for students to engage in the installation, maintenance and support of technology including:

- Computers, peripherals and networks;
- Video and multimedia;
- Telecommunications.

Recommendations for Success

- Implement approved Technology Support Technician programs when appropriate.
- Include students as part of the technology support infrastructure, resulting in hands-on learning laboratories and adequate technical support for the systems.
- Students will serve as aides and technical support to the instructional, administrative, clerical, and other district staff. Students will learn skills needed to perform tasks through classroom and live lab settings, including appropriate science, mathematics, active listening, customer service and teamwork course work.
- Work assignments will be provided with instructional staff and technicians in addition to classwork. These assignments will be regularly scheduled and will include a variety of experiences.

Objective B:

Technical education in technology support will be consistent with industry standards.

Recommendations for Success

- Assign qualified instructional staff to teach specific skills, based on industry experience or a combination of educational and industrial backgrounds.
- Advisory committees consisting of local and community industry representatives should review the curriculum content to ensure valid competencies are taught. Advanced level courses will engage students in curriculum assistance assignments either in the school or in community businesses on a pay for work basis.

Objective C:

Technology support programs will prepare interested students for entry level jobs and will enable students to articulate into postsecondary technical and academic educational opportunities.

Recommendations for Success

- Live work settings should be provided for advanced level instruction and work assignments throughout the district facilities in which students will master progressively increased skill levels. The program will be offered through a sequence of instruction.
- Course work will integrate academic and occupational skills for school credit which meets or exceeds graduation requirements. Students' educational objectives will be aligned with their occupational career objectives and/or will serve as an enhancement of the total learning environment offered by the school.
- Credit for learning while participating in school

work assignments will be a positive recruitment tool.

- Tech Prep agreements facilitating articulation will be developed with postsecondary institutions where possible.

Goal 8

Systems Support:

To provide district-wide support structures for training and for the installation, maintenance and support of technology systems.

Vision for the Future:

Tina has the best job in the district. That's what she'll tell you if you ask her. Since graduating from high school, and attending college in state, she has wanted to be a network administrator. She looks back on her time in high school, crawling all over the building installing wires and access ports, taking networking classes and helping maintain the system as the genesis of her ambitions.

In college, she learned the latest and most innovative system support models. State-of-the-art equipment and the best instructors helped to prepare her to maintain and support a network for her district.

Today she is at the elementary school. One of the teachers is using an interactive CD ROM from the library to teach her third-grade students phonics. There is a small problem accessing the library database. It is quickly fixed.

Next, she goes to the high school - the same high school she

graduated from a few years ago. The AP physics teacher has planned an interactive video link with the university, but has encountered a problem. By the time Tina arrives, one of her "computer kids" has already diagnosed and fixed the problem. She is proud of her student, and is proud to be his mentor.

Tina spends the rest of the afternoon developing a plan to integrate the district's E-mail system with a remote access via the Internet. Many teachers have taken advantage of incentives by local businesses to provide computers for their use at home, and Tina wants to be sure they have secure access to their school e-mail.

Goal Rationale:

There was a time in the not too distant past when districts had few computers and the only system support they received was on the other end of a toll-free help line. Computer networks and systems have become much more complicated and complex, and district use of networking systems has soared. Research shows that unless teachers get immediate response to technical problems, they will not use the technology.

With systems either in place, or on the way, districts must provide for the maintenance and support of these systems. The Idaho legislature should appropriate sufficient funds to ensure that districts have the ability to support and maintain their systems.

Districts are encouraged to make supporting the backbone of their technology systems a high priority, and the recruitment of trained and qualified professionals should be a cornerstone. The state will offer support services to districts, and districts are encouraged to partner with each other to share limited resources.

Objective A:

Districts will offer complete and efficient and ongoing network maintenance and support.

Methods and Recommendations for Success:

- Secure well-trained, qualified professionals to maintain and support network systems.
- Enter into collaborative agreements with other districts to share systems support professionals when appropriate.
- Provide on-going training for district and building level technology support staff.

Objective B:

Districts will utilize community, regional and state expertise in networking support.

Methods and Recommendations for Success:

- Form collaborative partnerships with local industry, business, libraries and educational institutions for the purpose of sharing professional networking expertise.
- Take advantage of state support offered by the Department of Administration, the State Department of Education and other State Board of Education Agencies, such as Community Colleges, technical schools and university networking professionals.

Objective C:

The regional technology advisors will collaborate with

districts to provide training and support for their networking professionals.

Objective D:

The ICTL and the State Department of Education will create a full-time position to support rural and remote districts' networking and telecommunications infrastructures.

Recommendations for Success:

- Hire a qualified professional for the State Department of Education, with expertise in telecommunications and networking infrastructure, design and implementation.
- Review, as a function of the State Department of Education, all pertinent literature and technological developments concerning networking and telecommunications infrastructure for dissemination to districts.

Appendices

Appendix A
Legislative charge
by Catriona Ayer,
State Department of Education

Interim Report of the Idaho Educational Technology Initiative of 1994

In this report to the 1996 legislature, the State Department of Education examines the effect of the Idaho Educational Technology Initiative funding on technology in public schools in Idaho. Information reviewed includes:

- Technology Grant Applications for 1994-1995;
- Technology Grant Application and Progress Reports for 1995-1996;
- National Reports on Educational Technology;
- The Interim Evaluation of the Idaho Educational Technology Initia tive published by the Legislative Services Office of the Idaho Legislature;
- Transcripts from Public Meetings on Technology held throughout the state in October 1995;
- Idaho Council for Technology in Learning (ICTL) minutes;
- Conversations with Regional Advisors, school district administrators, and teachers.

Background

Legislative History

The 1994 Legislature enacted the Idaho EducationaL Technology Initiative of 1994 (hereafter, "Technology Initiative") which allocated $3.4 million in ongoing funds for distribution to Idaho schools for the procurement of and training in, advanced educational technologies. "The state of Idaho recognizes the importance of applying technology to meet the public need for an improved and thorough public education system for both elementary and secondary education, post secondary and higher education and public libraries."

Idaho Council for Technology in Learning (ICTL)

Under the Technology Initiative, the Governor appointed a 15-member council consisting of the State Superintendent of Education, four legislators, and representatives of various state educational agencies. The 1995 Legislative Joint Finance Committee voted to set aside part of the public school appropriation for Council expenses including permanent staffing through the Idaho State Department of Education's Technology Center. Regional Technology Advisors also support the Council in its work. Each advisor is an employee of a state supported university, college, or vocational institution. The advisors meet regularly with the State Department of Education Coordinator of Educational Technology to plan regional support activities for K-12 districts throughout the state in conjunction with local colleges of education.

The eight technology goals of the Council are:

- To improve the quality and effectiveness of classroom instruction and learning by integrating technology-based resources in conjunction with state curriculum frameworks;
- To ensure the compatibility of technology related equipment to facilitate a comprehensive statewide network system;
- To facilitate collaboration with the colleges of education in the preparation and inservice training of teachers for integration of technology into instructional practices;
- To encourage the collaboration of schools, community members, or ganizations, businesses, industries, and post-secondary institutions;
- To create technology systems that enhance the efficient operation of the schools;
- To plan, evaluate, and publicize the impact of technology on teaching, learning, resource utilization, and the efficient operation of schools;

- To train students in the installation, maintenance, and support of technology systems;

- To provide district-wide support structures for training and for the installation, maintenance, and support of technology systems.

Public School Technology Grants

"There is hereby established the public school technology grant program, which shall make available grants for schools to provide Idaho classrooms with the equipment and resources necessary to integrate information age technology with instruction and to further connect those classrooms with external telecommunications services. Grant applications shall include a project plan that describes proposed equipment and software purchases; how the proposed equipment and software will be used effectively in the classroom; provision for training teachers to make optimal use of the technology; provision for local matching funds as prescribed by the council; and other elements as prescribed by the council."

First Year Grants

In the first year of the grant process, the legislature allocated an additional $7 million in onetime funds to augment the $3.4 million of ongoing funds for the Educational Technology Initiative. Each district was asked to develop a three to five year technology plan in order to receive a basic grant of $20,000 per district and approximately $20 per student. An additional $3.2 million was set aside for competitive grants of up to $320,000 per district. The Northwest Regional Educational Laboratory reviewed and ranked the plans.

Second Year Grants

In the second year of the grant, competitive grants were dropped in favor of a formula that gave each district a base of $20,000 plus $35 per student. A total of $10.3 million was dispersed based on this formula. Districts are required to submit a "Progress Report" on their original technology plan with emphasis on revised budgets and progress made toward achieving the

eight technology goals developed by the ICTL. The Progress Reports were reviewed and approved by the Regional Technology Advisors.

FINDINGS

Timeline

Year One K-12 Technology Appropriation

The timeline (chart 1) shows the progression of events leading up to the distribution of the Year one money, appropriated by the 1994 Legislature. The grant application was developed during the summer of 1994 and then distributed to school districts in the fall of 1994. The districts were given time to develop their district technology plans over the 1994-1995 school year. In the spring of 1995, school districts submitted their grant applications, and grant payments were made between late February 1995 and late June 1995. School districts were given until June 30, 1996 to spend all of their Year one grant money. As a result, districts have not yet expended some of the $10.4 million appropriated for public schools. Two school districts chose not to apply.

Year Two K-12 Technology Appropriation

One hundred eleven of Idaho's 112 districts filed a 1995 grant application and progress report. The Regional Technology Advisors reviewed and approved the grants and all 1995 appropriations were dispersed.

Technology Purchases

School districts were required to account for their first year's grant award before receiving the second year award (chart 2). As demonstrated by the chart, nearly one half of the money (48.88 percent) went to computer hardware purchases. The second largest amount (21.59 percent) was spent on networking-related equipment and services. Many administrators feared this would be the only money received for educational technology, and therefore they chose to purchase as much hardware as possible. Computer peripherals (e.g., printers) accounted for approximately 4 percent of total

expenditures to date. The greatest variance in the proposed budgets came in the Salaries and Benefits area. Most districts explained that they paid less in salaries than anticipated because the grant money was received late in the year. Some districts chose to hire a full or part-time technology coordinator, while others used grant money to pay for substitutes so that teachers could attend technology training. Purchased Services and Supplies and Materials were the two smallest categories, accounting for 6 percent of all spending. Miscellaneous Capital Objects, including presentation and audiovisual equipment, totaled nearly 6 percent. Finally, software purchases, both instructional and administrative, accounted for approximately 8 percent.

Several districts reported they had spent considerable amounts of their own district funds on technology. These districts are large and small, urban and rural, and in all parts of the state. These reporting districts include:

School District	State Grant Received	Additional District Dollars Spent
Pocatello School District #25	$380,000	$305,780
Firth School District #59	$51,901	$43,554
Shelley School District #60	$52,162	$69,438
Basin School District #72	$68,138	$70,308
Horseshoe Bend District #73	$100,000	$26,476
Soda Springs School District #150	$99,507	$47,803
Clark County School District #161	$31,639	$24,682
Cottonwood School District #242	$66,500	$30,993
Moscow School District #281	$323,093	$75,956
Lapwai School District #341	$98,409	$31,076
Wallace School District #393	$79,392	$37,511
Twin Falls School District #411	$747,728	$476,272
Murtaugh School District #418	$39,315	$26,146
McCall-Donnelly School District #421	$196,398	$358,024

District Proposed Year 2 Appropriations (chart 3)

The first pie chart shows the proposed district K-12 expenditures of state grant money. The second pie chart reflects the district's proposed expenditures of their own in-kind dollars.

Districts envision spending nearly two thirds of the state grant funds on capital expenditures, including computers and networking. Districts anticipate spending more money, both state and local district dollars, on supplies and materials, including software and other instructional materials.

Purchased services, including training and consulting, are also scheduled to increase. Salaries and benefits are proposed to be the smallest expenditures of the state grant monies.

The school districts have proposed spending $11,239,808 of their own funds in support of educational technology. This represents better than a one to one matching of state dollars with district dollars. The largest portion of this money is slated to be spent on capital expenditures. Nearly 30 percent of district funds will be spent on supplies and materials, including software. Furthermore, approximately 20 percent of district funds expended in support of technology will be for salaries and benefits.

Total of K-12 Computers and the Student to Computer Ratio

The largest single category of hardware being purchased is computers. According to national market data figures, more than 6,000 computers were purchased by public schools in Idaho during the 1994-1995 school year. This represents a dramatic increase over the previous four years, during which schools purchased approximately 2,000 computers per year. According to the same research organization, in the 1994-1995 school year, there were approximately 22,000 computers in Idaho public schools (chart 4). A review of the 1995 Grant Application/Progress Report shows a total of more than 29,000 computers in Idaho schools today. This represents a student to computer ratio of 8.2 students per computer. For the second year in a row, Idaho schools have a better student to computer ratio than the national average (chart 5).

Other technologies are being implemented at approximately the same rates as the national averages. Internet connectivity, CD-ROM, and Local Area Networks show the strongest growth. Preliminary estimates indicate that Idaho has a higher percentage of school districts with satellite receivers than the national average.

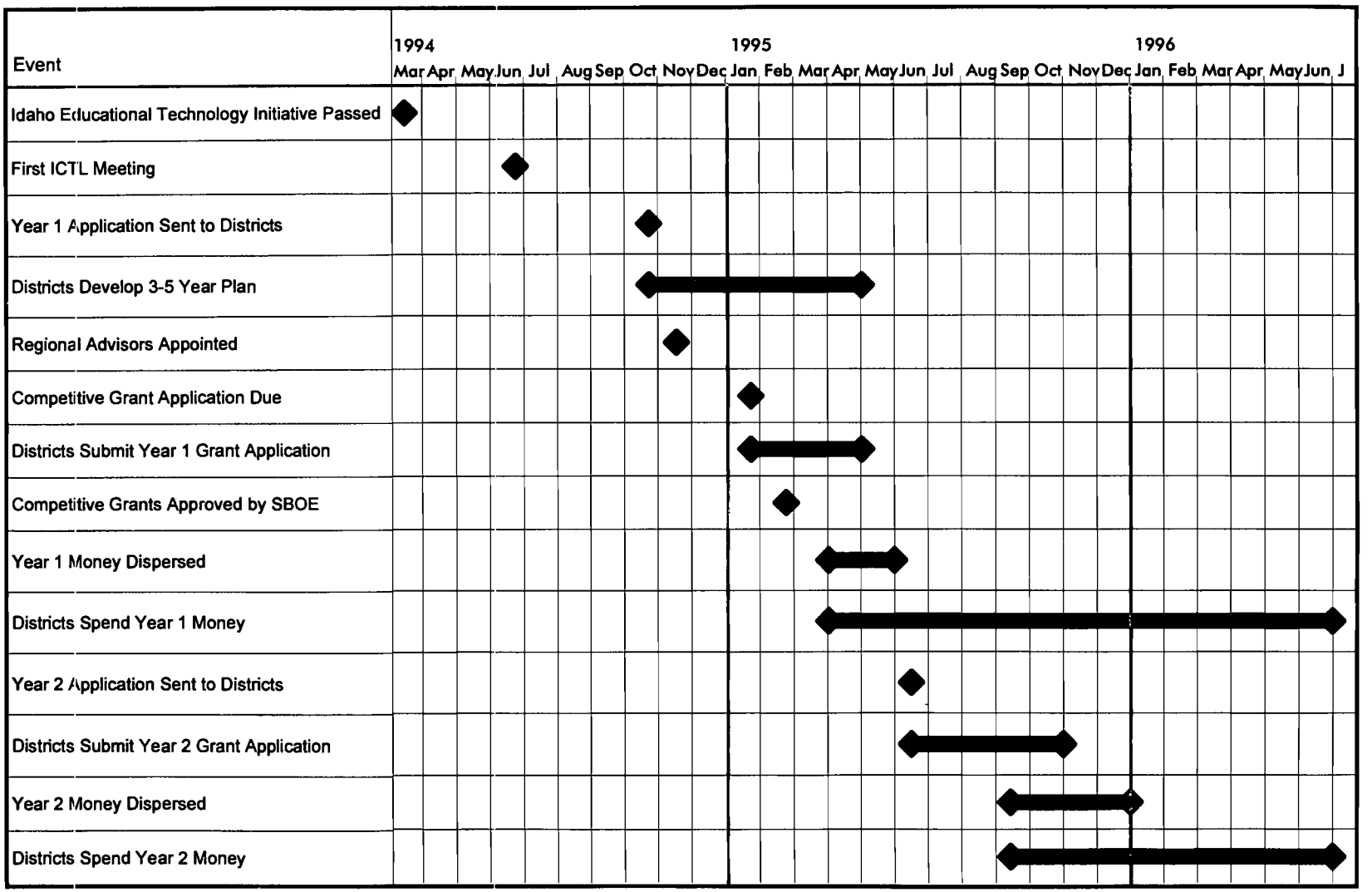
District Priorities for Teacher Training

School districts were asked to report their training needs in the 1995 Grant Application/Progress Report (chart 6). By far the greatest need is training

in software selection and implementation. The second largest reported need was for Internet training. Multimedia creation follows as a third priority. The next most frequently reported training need concern the use of basic software tools. Despite the fact that school districts listed networking as their tenth training need, technology coordinators indicate this was one of their most needed areas of instruction.

Regional workshops were held throughout the state during March and April 1996, at which the top training needs were addressed. Further instruction was offered through the colleges of education through both their technology outreach programs and in their regular course offerings.

Public Schools Technology Grant Dispersal
(Idaho Educational Technology Initiative for K-12 Schools)

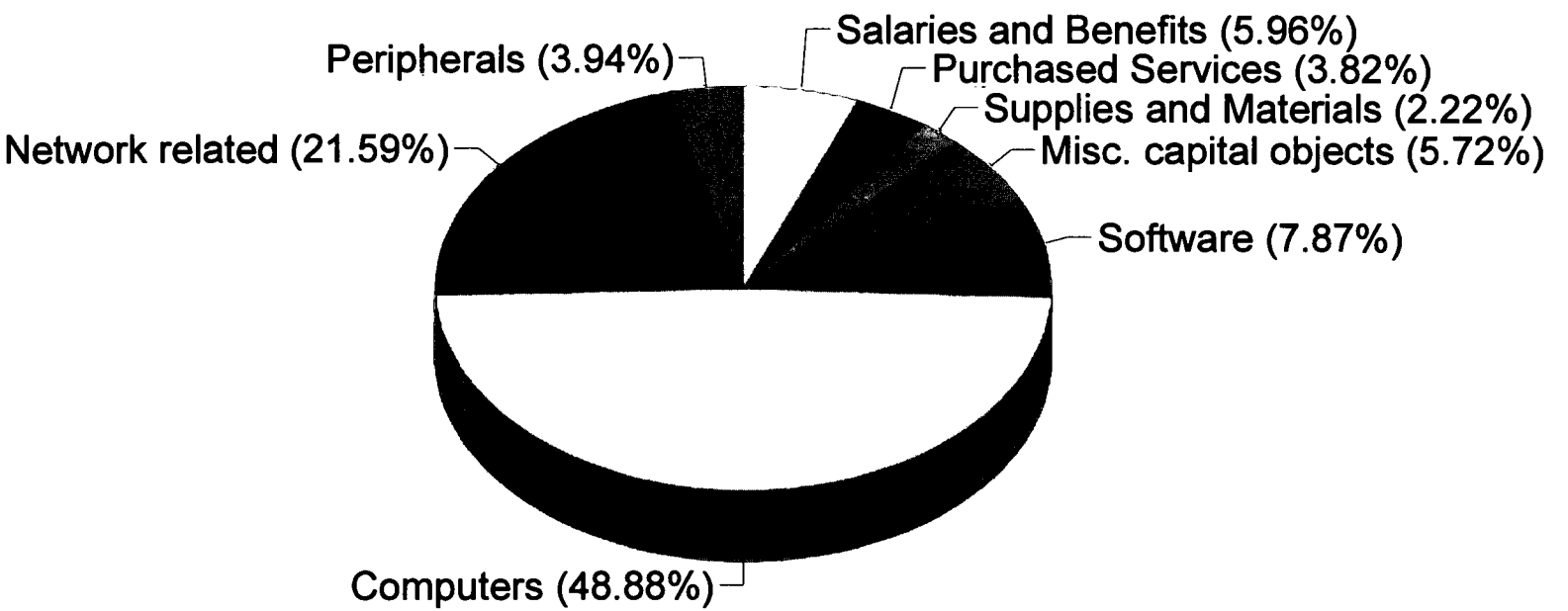


Idaho State Dollars Spent on K-12 Technology

Reported on/before Oct. 31, 1995

Year 1 (1994 Appropriation of $10.4 million)

Money must be spent by June 30, 1996

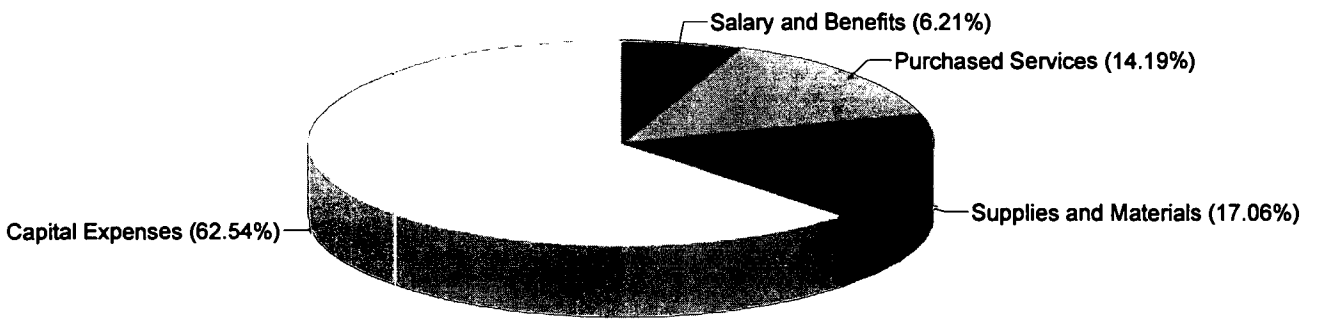


This chart represents $7,392,636

Idaho State Dollars To Be Spent on K-12 Technology

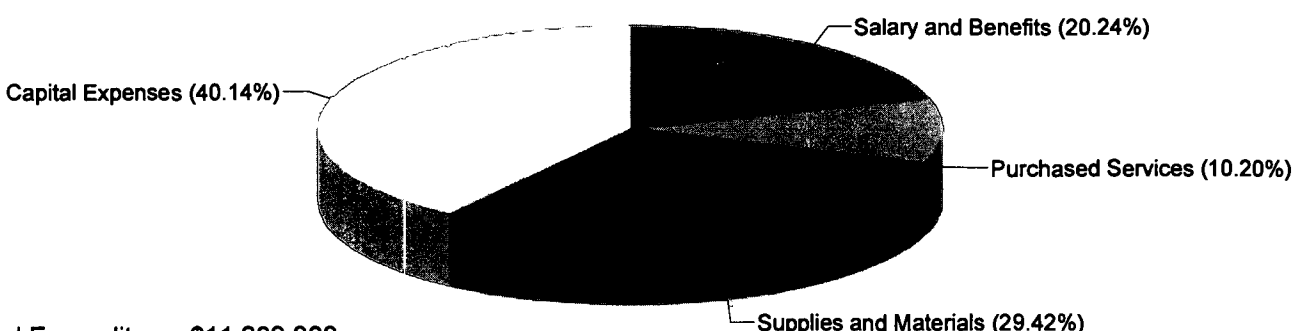
1995/Year 2 $10.4M Appropriation

District Proposed State Grant Expenditures



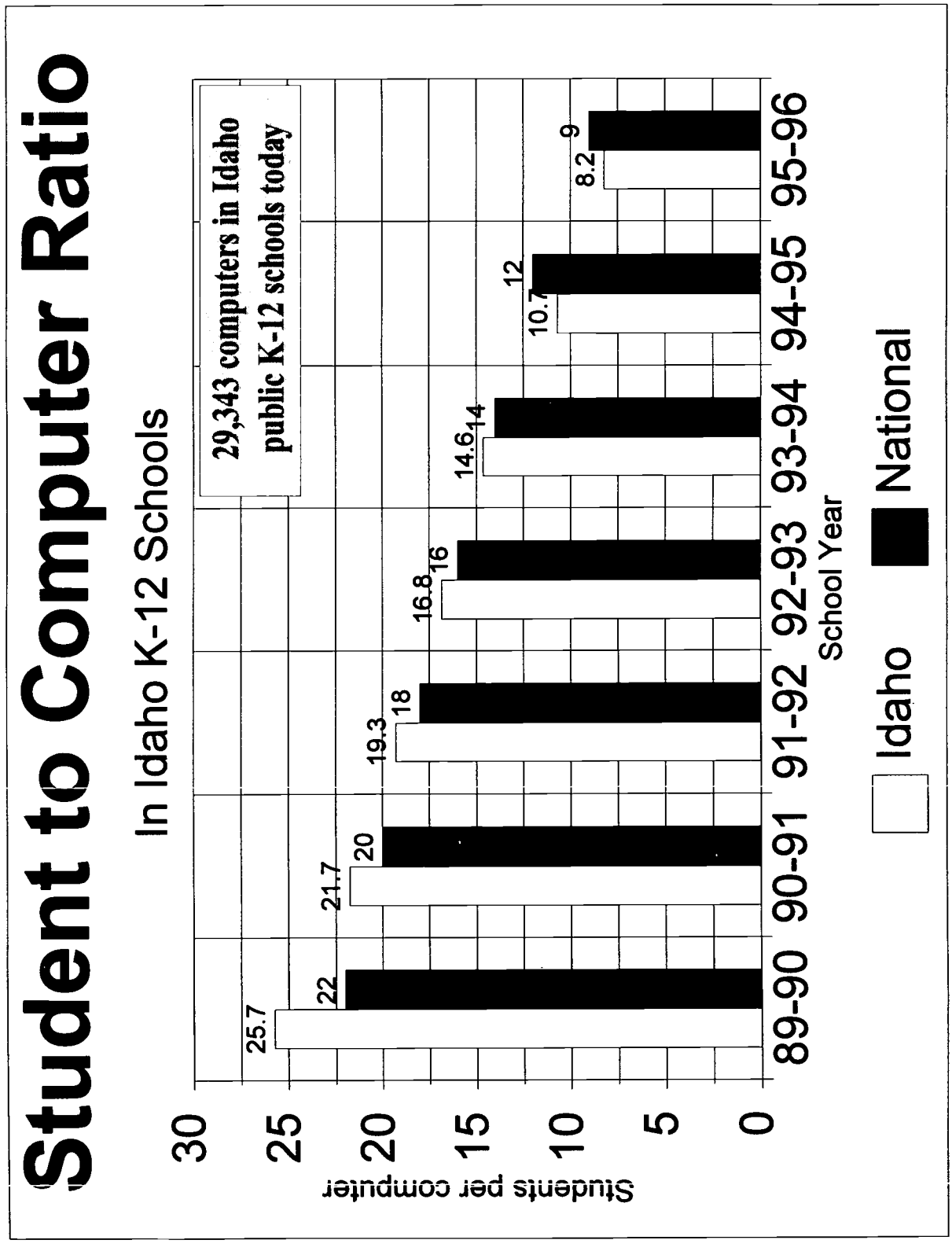
State Grant Expenditure $10,320,000

District Proposed In Kind Expenditures



District In-Kind Expenditures $11,239,808


Total Computers in Idaho K-12 Public Schools
Computers
30000
25000
20000
15000
10000
5000
0
8442
10243
11707
13763
16175
22508
29343
1989-1990
1990-1991
1991-1992
1992-1993
1993-1994
1994-1995
1995-1996



Training Needs
Expressed in 1995 Technology Progress Reports

Need	Rank
Software Implementation	1
Internet	2
Multimedia	3
Software Selection	4
Word Processing	5
Presentation Software	6
Telecommunications	7
CD-ROM	8
Administrative Use of PCs	9
Networking	10
Desktop Publishing	11
Hardware care	12
Special Needs/Assistive Technology	13
Instructional Television	14
Distance Learning	15
Hardware Selection	16
Computer Graphics	17
HyperMedia creation	18
Desktop Video	19
Graphing Calculators	20

Authorizing Legislation

TITLE 33
EDUCATION

CHAPTER 48
IDAHO EDUCATIONAL TECHNOLOGY INITIATIVE

33-4801. SHORT TITLE. This chapter shall be known and may be cited as the "Idaho Educational Technology Initiative of 1994."

33-4802. FINDINGS. The legislature hereby finds, determines and declares that the state of Idaho recognizes the importance of applying technology to meet the public need for an improved and thorough public education system for both elementary and secondary education, postsecondary and higher education and public libraries.

33-4803. DEFINITIONS. As used in this chapter:

(1) "Educational segments" are, individually, the public elementary and secondary school system, the vocational education system, the community colleges, and the four-year colleges and universities.

(2) "IPBS" means the Idaho public broadcasting service.

(3) "Instructional video service providers" means publicly and privately funded television agencies that offer instructional video programming and services without commercial advertising.

(4) "Libraries" means district, city, and school/community libraries as described in chapters 26 and 27, title 33, Idaho Code.

(5) "Technology" means technology-based materials, equipment, systems, and networks.

33-4804. STATE COUNCIL FOR TECHNOLOGY IN LEARNING CREATED — MEMBERSHIP.

(1) There is hereby created and established the state council for technology in learning under the state board of education, referred to herein as the council.

(2) The council shall consist of fifteen (15) members who shall be appointed as follows:

(a) The superintendent of public instruction, or his designee.

(b) The governor shall appoint one (1) practicing public school administrator, one (1) business representative with experience in applications of technology, one (1) representative of the division of vocational education, one (1) vocational/applied technology teacher, one (1) practicing public school teacher, one (1) public librarian, one (1) public school media special-

ist, one (1) member of the state board of education, and one (1) member of the faculty of a public higher education institution.

(c) The president pro tempore of the Idaho senate shall appoint two (2) members of the senate, one (1) from each of the two (2) largest political parties.

(d) The speaker of the house of representatives shall appoint two (2) members of the house of representatives, one (1) from each of the two (2) largest political parties.

(e) The chair of the state board of education's telecommunications council.

(3) Members appointed by the governor and legislative leadership shall serve at the pleasure of the appointing official.

(4) Members of the council shall receive compensation as provided in section 59-509(b), Idaho Code.

33-4805. RESPONSIBILITIES OF THE COUNCIL — COUNCIL STAFF.

Staff support for the council shall be drawn from the agencies and institutions under and affiliated with the state board of education including, but not limited to, the colleges and universities, community colleges, technical colleges, division of vocational education, department of education, Idaho public television, state library and office of the state board of education.

The council shall have the following responsibilities:

(1) Make recommendations to the state board of education on educational technology plans, policies, programs and activities.

(2) Subject to the approval of the state board of education, administer and develop standards and criteria for the public school technology grants program provided for in section 33-4806, Idaho Code.

(3) Ensure that the recommendations made in "Telecomm 92" are considered in implementing educational technology programs pursuant to this chapter.

(4) Collaborate with educational institutions, including libraries, public schools, higher education, technical and community colleges, professional education associations, and businesses in recommending priorities for funding and in identifying needs for technology use in education.

(5) Recommend to the state board of education, standards and procedure for the administration of this act, including, but not limited to, standards for technology-based resources, projects, programs, practices or products to be adopted or adapted, and standards and criteria by which to evaluate the technology-based programs.

(6) Recommend exemplary programs, practices, or products based on the criteria established in subsection (5) of this section.

(7) Recommend priorities for uses of educational technology.

(8) Work with representatives of the governing bodies of the educational segments to develop recommendations or strategies for the coordination, administration, and evaluation of educational technology programs and resources.

(9) Work with representatives of the governing bodies of the educational segments to identify

strategies to coordinate statewide voice, video, and data telecommunications systems that may be accessed by the educational segments.
(10) To review, evaluate and build upon the educational technology projects in public schools funded through other state initiatives.

33-4806. PUBLIC SCHOOL TECHNOLOGY GRANTS. There is hereby established the public school technology grant program, which shall make available grants for schools to provide Idaho classrooms with the equipment and resources necessary to integrate information age technology with instruction and to further connect those classrooms with external telecommunications services. Grant applications shall include a project plan that describes proposed equipment and software purchases; how the proposed equipment and software will be used effectively in the classroom; provision for training teachers to make optimal use of the technology; provision for local matching funds as prescribed by the council; and other elements as prescribed by the council.

33-4807. EVALUATIONS AND AUDITS. On or before July 1, 1995, the legislative services office shall initiate an interim evaluation of the relative impact, costs and benefits of each of the programs conducted pursuant to the appropriations made for the Idaho educational technology initiative during the second regular session of the fifty-second legislature. The evaluation results shall be reported to the governor, legislature, and state board of education on or before January 1, 1996. On or before July 1, 1996, the legislative services office shall initiate a comprehensive evaluation of the relative impact, costs and benefits of each of the programs conducted pursuant to the appropriations made for the Idaho educational technology initiative during the second regular session of the fifty-second legislature. The evaluation results shall be reported to the governor, legislature, and state board of education on or before July 1, 1997.

33-4808. SEVERABILITY. The provisions of this chapter are hereby declared severable, and in the event that any word, phrase, sentence, clause, paragraph or section of this chapter be determined by a court of competent jurisdiction to be invalid for any reason, such partial invalidity shall not affect the validity of the remainder of this chapter.

Appendix B
Info Tech '96
Recommendations

Info Tech '96 Recommendations

Education

The Task Force reviewed the education and health care goals found on paces 34-41 of *TELECOMM '92 Connecting Idaho to the Future.* The Task Force found the goals and strategies of health care to be accurate and for the most part, adequate. They felt the coals and strategies for education needed to be coordinated to help eliminate duplicate services and infrastructures within the state.

GOAL: The State Board will:

- Coordinate information technology among all the educational entities.
- Provide a mechanism by which these technologies can be coordinated with entities outside education.

Objectives:

- Establish a focal point technology coordination among the entities for which the Board sets policies.
- Establish a simple interface so those outside of education can have access to the educational information technology infrastructure.
- Make it efficient for entities outside of education to work with education in the development of information technology infrastructure.
- Create a mechanism by which education can access the infrastructure developed by the state.

GOAL: Use information technology to improve the quality, availability and efficiency of Idaho public education for children and adults.

Objectives:

- Integrate information technology into the public K- 1 2 educational system.
- Integrate information technology into preparation of Idaho's workforce.
- Integrate technology into the higher education system.
- Coordinate technology across education levels, the public libraries and with agencies and entities outside of education.
- Provide life-long learning opportunities.
- Integrate information technology into the public libraries.

Appendix C
ICTL Guidelines

The following guidelines have been adopted by the Idaho Council for Technology in Learning (ICTL) to serve as basic guidelines for Idaho School Districts as they review and update their five year technology plans.

It is the intent of the ICTL for each district to develop a long range networking plan that will provide for a cost-effective transition from standalone workstations to local-area networks (LANs), from networked labs to schoolwide networks, and from school networks to a district wide-area network (WAN). During each step, the local school district should plan for the most economically practical and effective communications with the outside world. Furthermore, the local district should address the connectivity issues of security and adequate human resources for network maintenance.

Software Copyright Issues:

It is the responsibility of administrators, teachers, students, and staff to ensure that software is used with integrity and honesty. The use of software should be conform to all applicable license agreements.

1. Software purchased by the School District must be used in accordance with the license agreements stated by the manufacturer.

2. Software purchased for a single computer shall not be copied to additional district computers. Software may be copied to floppy (micro disks) for archival purposes or to avoid using master disks only.

3. District computers may not be used to copy, disseminate, alter or transmit software in a manner that voids the license or copyright of that software.

4. Software described as "shareware or public domain software", used by a district, teacher, or staff will also comply with the payment, site licensing and copyright stated by the originator.

5. It is contrary to basic honesty and integrity for administrators, teachers, students or staff to use a computer containing software installed or used in violation of the license agreements or copyright laws.

6. Licensed or copyrighted software that is purchased by the district,

teacher, or staff will maintain documentation of record of installations or a site license to use software.

7. Use or privately-owned computers in the district is subject to the same rules pertaining to software as those owned by the district.

8. The district "Site-licensed" software will be kept and used only on district owned computers. Site-licensed software cannot be licensed, sold, leased or loaned for use on privately-owned computers not can it be licensed, sold, leased or loaned to individuals.

9. The district will maintain and ensure that the appropriate number of copies of the correct version of all software is maintained on district computers.

Computer Guidelines

Setting Priorities:
With new computer models being released every three to six months, standards concerning computer architecture is a moving target at best. Todays $2000 multimedia computer may be tomorrows bargain basement model. Districts must base computer purchases on several factors.
1. What are the district curriculum goals for each level of K-12 education? Educational levels tend to fall into K-3, 4-6, 7-9 and 10-12.
2. What software and associated peripherals support the specific learning skills being taught at each educational level?
3. After the first two questions are asked, then the third question is what "computer system" (hardware and networking) best supports the first two priorities?

Financial Considerations:
Computer equipment is now considered to be depreciated within 5 years. In schools, computers are often pressed into service for twice or three times that period. The next questions is then one of "cash-flow." The district must have a long range plan for financing not only maintenance but also computer replacement. Districts will make financial considerations based on questions such as:
1. Is cash flow better served by leasing rather than purchasing? If computers are still viable teaching tools at the end of the lease, can they

be purchased?
2. Can the computers that are obtained today, be upgraded in the future? Can Ram be easily expanded? Can processors, power supplies, hard drives, CD Roms, video boards, sound boards etc. be easily replaced?
3. Is the software we are using today be upwardly compatible?
4. Will the software and hardware companies that are being used today, likely be here in five years?
5. What time elements are involved in training teachers in the proper use of currently used software and hardware?

Used Computers and Peripherals and the Point of Diminishing Returns:
As in all technology, new is constantly replacing old. There are several questions that must be asked by every district.
1. Every technology has a price / utility point that reaches a point of diminishing returns. For example, should third graders be given $2000 multimedia machines for learning keyboarding when a $200 smart keyboard would work just as well?
2. ICTL guidelines ask each district to move towards networking computers. What will be the cost of upgrading older units to work on the network? Can the older computers work together in a simple peer to peer network in a stand alone computer lab?

Major Platforms:
The education marketplace has traditionally been served by the Apple and IBM platforms. While other computer platforms have been used over the years, Macintosh and Dos/Windows based IBM clones now predominate the market. New purchases of personal computers will doubtless fall into these two major platforms.
Unix based mini-computers are also common in larger districts where they are used as the central processors for a district wide network. Higher level courses in vocational education and sciences have also used workstations by Sun Microsystems.

Multimedia Computers (not basic workstations)
The following specifications are considered as "minimums" for multimedia work.
"Minimum" system requirements: PC's
486DX2-66, (Pentium is preferred)
16mb RAM, 700 mb HD
14 inch SVGA, 256 colors

1.44 mb floppy, mouse,10 mbit transfer network certified
Two serial, one printer port.
Options:
Quad Spin MPCII Cd Rom*, 28.8 modem*, Video Capture Card

Minimum System Requirements: Macs
68040, (Power PC is preferred)
8 -16 mb RAM, 1 Gb HD
14 inch RGB, 256 colors
1.44 mb floppy, mouse
System 7.5, QuickTime for Mac
10 mbit transfer network certified.
SCSI, printer ports
Options:
Quad Spin CD Rom*, 28.8 modem*, Video Capture Card

COMPUTER NETWORKING:
Ethernet has become a defacto standard across the nation. Other networking standards such as Token Ring, Lantastic and AppleTalk can all be connected as "sub-networks" to a larger Ethernet network.
A. New purchases should consider ethernet as the backbone for connecting new computers as well as older established networks.
B. Category "5" cabling in a star configuration has also become a defacto standard for its ability to carry voice, data and both digital video. Note: Category "5" wire will not carry 100 mbit if strict installation proecedures are not adhered to.

INTERNET CONNECTIVITY:
Current Idaho State telecommunication guidelines are established by the Department of Administration under the Office of the Governor. All districts should should base their Internet connectivity on the industry TCP/IP standard.
A. Each district should seek the best source available for Internet connectivity, cable service and telecommunications service. Districts experiencing any difficulty in these areas should contact the ISDE Curriculum Technology Center for assistance.

NETWORKING:

Security:
Each district should establish a hierarchy of rights for network users (students, teachers, administrators, etc.) to control access to the network server and other resources.

Wiring:
A district five year plan should include a wiring scheme for voice, video and data. New buildings should be designed with wiring being pulled at the time of construction. Older facilities should include retrofit plans that are economically attainable in the course of the district plan. Plans should include the installation of wiring closets. Then as design phases are implemented, appropriate electronic components can be installed within the closets.

LAN:
Local-area networks link computers over a relatively small geographic area and should be part of an integrated model. Integrated models of networked schools are those designed to connect most or all parts of the school, so that technologies and databases are accessible and useful wherever they are needed.

WAN:
Wide-area networks enable users to connect to sites outside the school, expanding student, teacher, and administrator outreach to external resources, databases, library resources, video retrieval, and other individuals. The plan for a wide-area network must include a router and a CSU/DSU (digital modem). This will make possible connection to the information highway, facilitating communication among schools, the ISDE, libraries, state government, and the world beyond.

Intra-District Planning:
The ICTL strongly encourages the collaboration of technology planning between districts. Purchasing efforts should be well-planned, organized, and coordinated with many partners, including local education agencies, ISDE, universities, community colleges, private colleges, local government, state government, businesses and organizations. Beyond purchasing, such collaboration will assist districts in adult education, teacher training, support personnel, maintenance, software license management and resource

people.

Distributed Network:
Many educational networking vendors are now introducing distributed networks to school districts. The idea is that of combining all educational media from a centralized media center in the building or the district through a LAN or WAN. While this fits the model of moving voice, video and data or the same network, the district must apply the question of overall cost vs. diminishing point of return. As technologies in this area continue to mature, prices will certainly fall and become much more competitive. As of June, 1996, video compression techniques have not yet reached the quality and affordibility of a centralized analog video distribution system.

Architetural Standards:
Contact, Eldon Nelson; ISDE Support Services Supervisor. 208-334-2203

Appendix D
Graph of Public Meeting Input

Needs and Concerns Voiced at Public Meetings

Need/Concern	Lewiston	Boise	Nampa	Post Falls	Twin Falls	Pocatello	Idaho Falls
Hardware Selection	✓				✓✓		
Hardware care and maint.					✓		
Telecommunications/Telecom '96	✓	✓	✓	✓✓	✓	✓✓✓	✓
Special needs					✓✓		
Distance Learning	✓	✓	✓			✓	
Computer graphics	✓				✓		
Multimedia	✓				✓		
Desktop publishing					✓		
Software Selection	✓	✓	✓				
Admin use of computers					✓✓	✓	
Software Implementation		✓			✓	✓	
Internet	✓✓	✓	✓✓✓	✓	✓✓✓	✓	✓
Instructional TV							✓
Networking	✓✓✓	✓	✓		✓✓	✓	
Use of CD-ROM			✓✓				
Desktop Video					✓		
Keep $$ flowing		✓	✓	✓	✓	✓	✓
Need technology staff/one or more in every building			✓✓			✓✓✓✓	✓
Teacher training	✓✓	✓✓	✓✓✓	✓✓	✓✓✓✓✓	✓	
Teacher Mentor Program					✓		
Employment Skills/School to Work			✓	✓✓	✓✓	✓✓	✓
V-Sat		✓✓					
Community Services/Parent Involvement						✓	✓
Federal/State Grants/Confidentiality							
Computer Lending Library			✓	✓			✓
Goals 2000	✓✓		✓✓		✓		✓
Vocational Ed. Programs			✓		✓	✓	
BSU-Video Link			✓				
PUC Rates			✓	✓	✓		

Needs and Concerns Voiced at Public Meetings

Need/Concern	Lewiston	Boise	Nampa	Post Falls	Twin Falls	Pocatello	Idaho Falls
Satellite Technology/Are the schools that have them, using them properly?			✓✓✓	✓		✓	
Video Compression	✓		✓			✓	
Star Schools/not being used/too expensive--dropped			✓✓			✓✓	
Grant $-How can it be spent?	✓✓	✓✓	✓	✓✓	✓✓	✓	✓✓✓
U.S. West Line Charges		✓	✓✓		✓✓		
Owning your own PBX Control/T-1			✓				
Technology Knowledge: What, When, Where, How to make the right decisions without technical knowledge. Want help from State.	✓✓	✓✓	✓	✓	✓		
Does the state have an evaluation system in place for software?	✓	✓	✓✓				
Need for a Network Specialist			✓			✓✓	
Need more Technology Workshops			✓			✓	
Technology Curriculum/Age appropriate software			✓			✓✓	
New Schools need to be built with technology in mind. Adequate wiring/archetectural designs for computers, networks, etc.			✓	✓			
Computer Knowledge should be a requirement upon graduation						✓✓	
Student aren't aware of what is available to them						✓	
State Technology Plan	✓✓✓	✓	✓	✓✓✓	✓✓		✓
Technology needs to be at every level K-12						✓	
Technology for children with disabilities					✓	✓	
Coordinate State-Wide in-servcie days to teach technology to teachers						✓	
Teachers-Hiring requirements in technology		✓		✓	✓	✓✓	
Teacher certification in technology				✓		✓✓	
Maintenance of Computers	✓			✓			
Grant $--State is not consistent in handing out grant money					✓✓		
Certain districts hired professional grant writers					✓		
State should regotiate a plan to get Internet connected. Districts should not have to use the grant $ for technology to get connected.					✓		

Appendix E
Sample Classroom Configurations*

*Reprinted with permission of the Mississippi State Department of Education

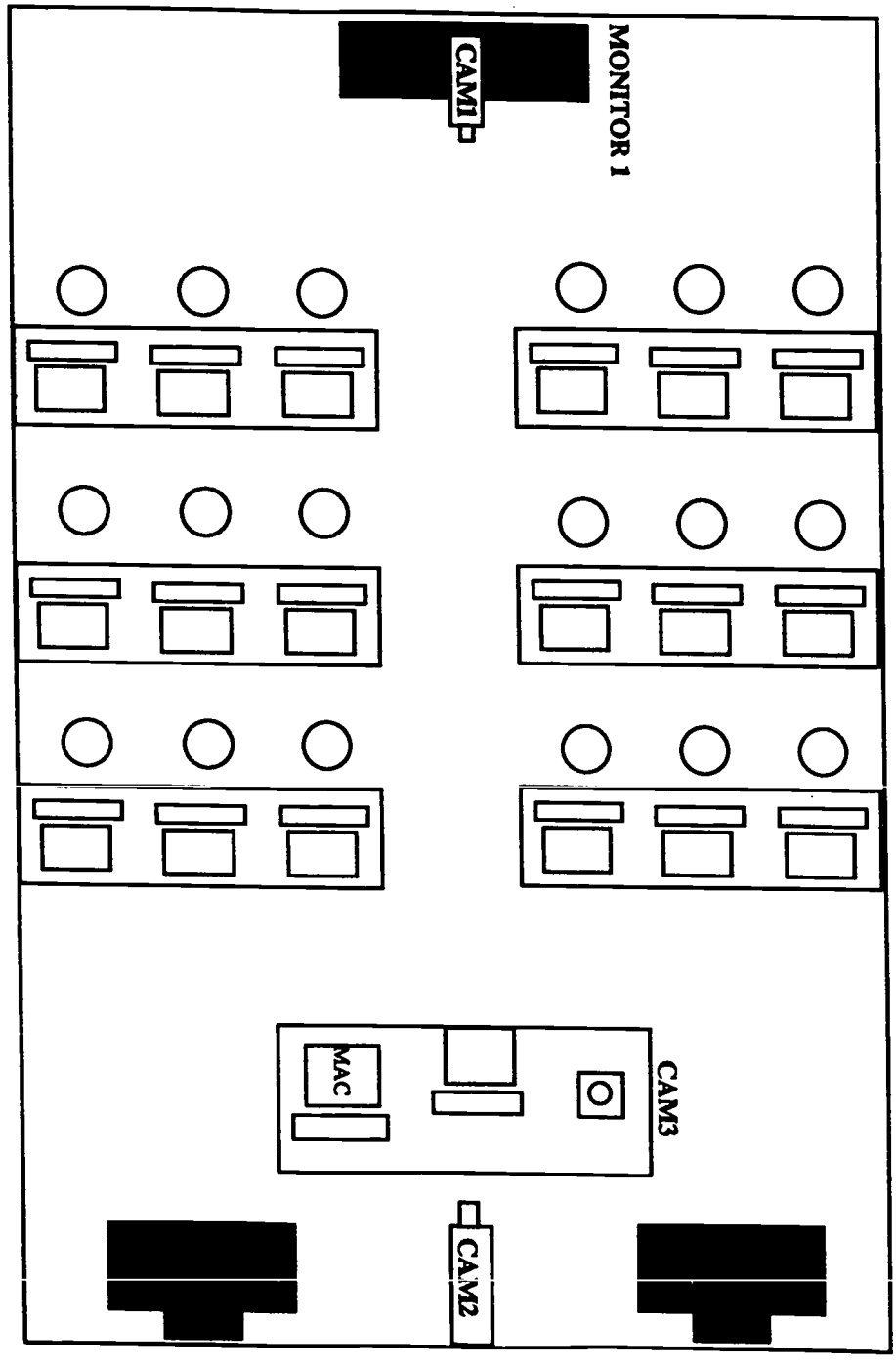
Legend

Computer Laboratory Figures

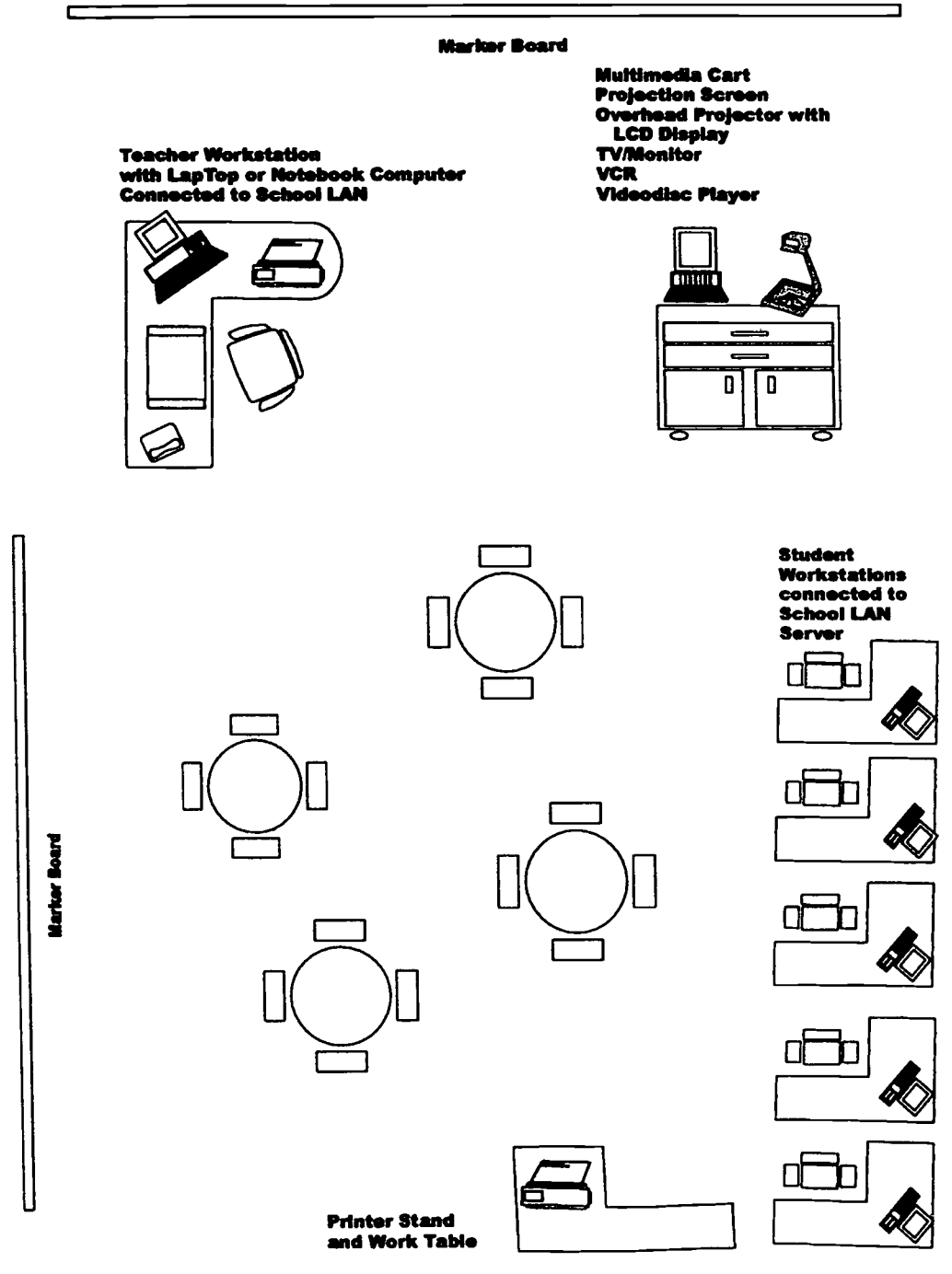
(for pages H-5 and H-6)

1. Storage room with cabinets and shelves
2. Network equipment area (ventilated)
3. Laser printer
4. File server on a separate electrical circuit
5. Uninterruptable power source (UPS)
6. Telephone interface (for optional Internet connection equipment0
7. Dot matrix printer
8. Teacher workstation and chair
9. AV cart
10. Work tables (2), side chairs (4)
11. File cabinet
12. Master on/off switch
13. Student workstations with chairs
14. Bookcase
15. White board

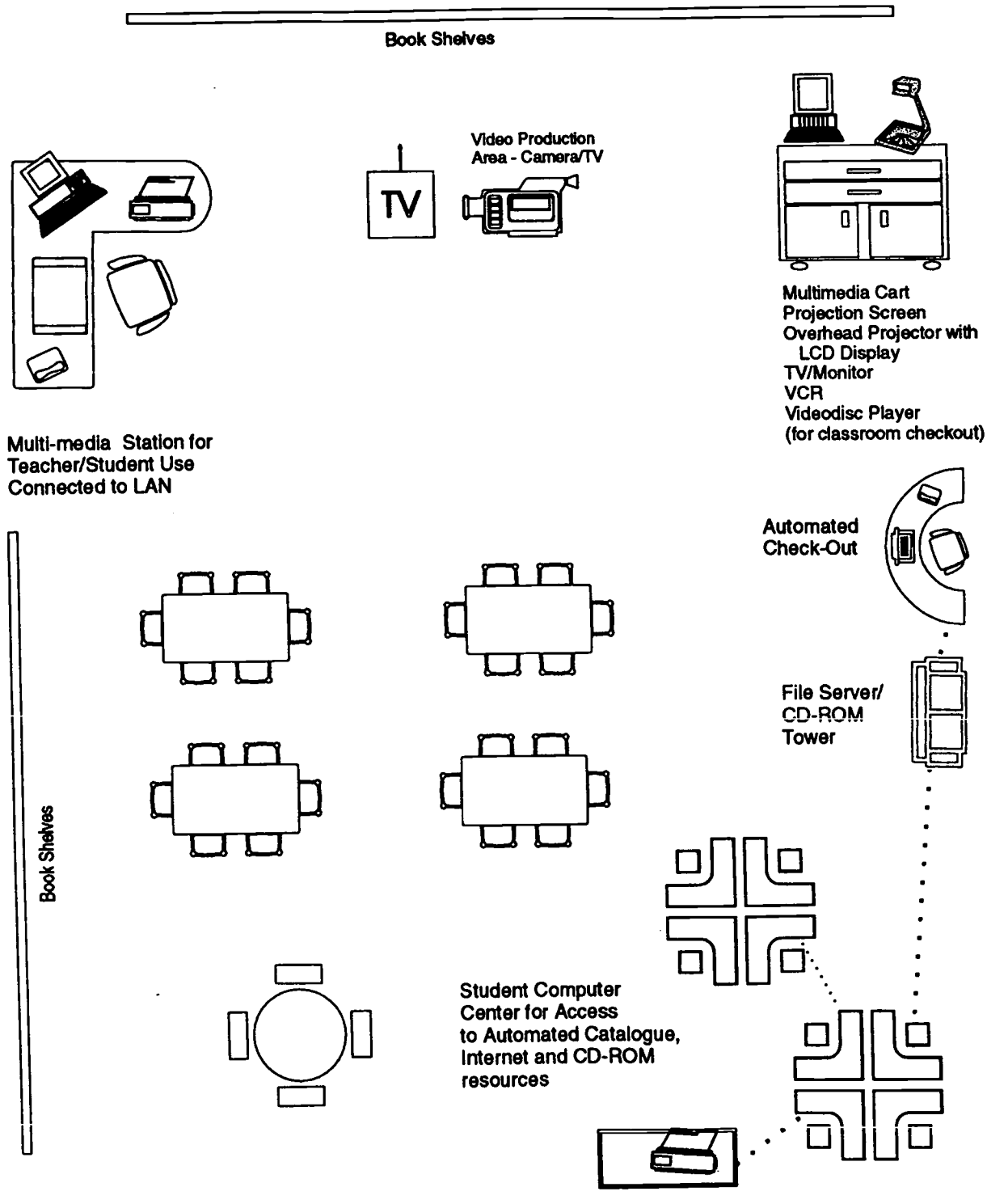
Sample Video-Conference Classroom

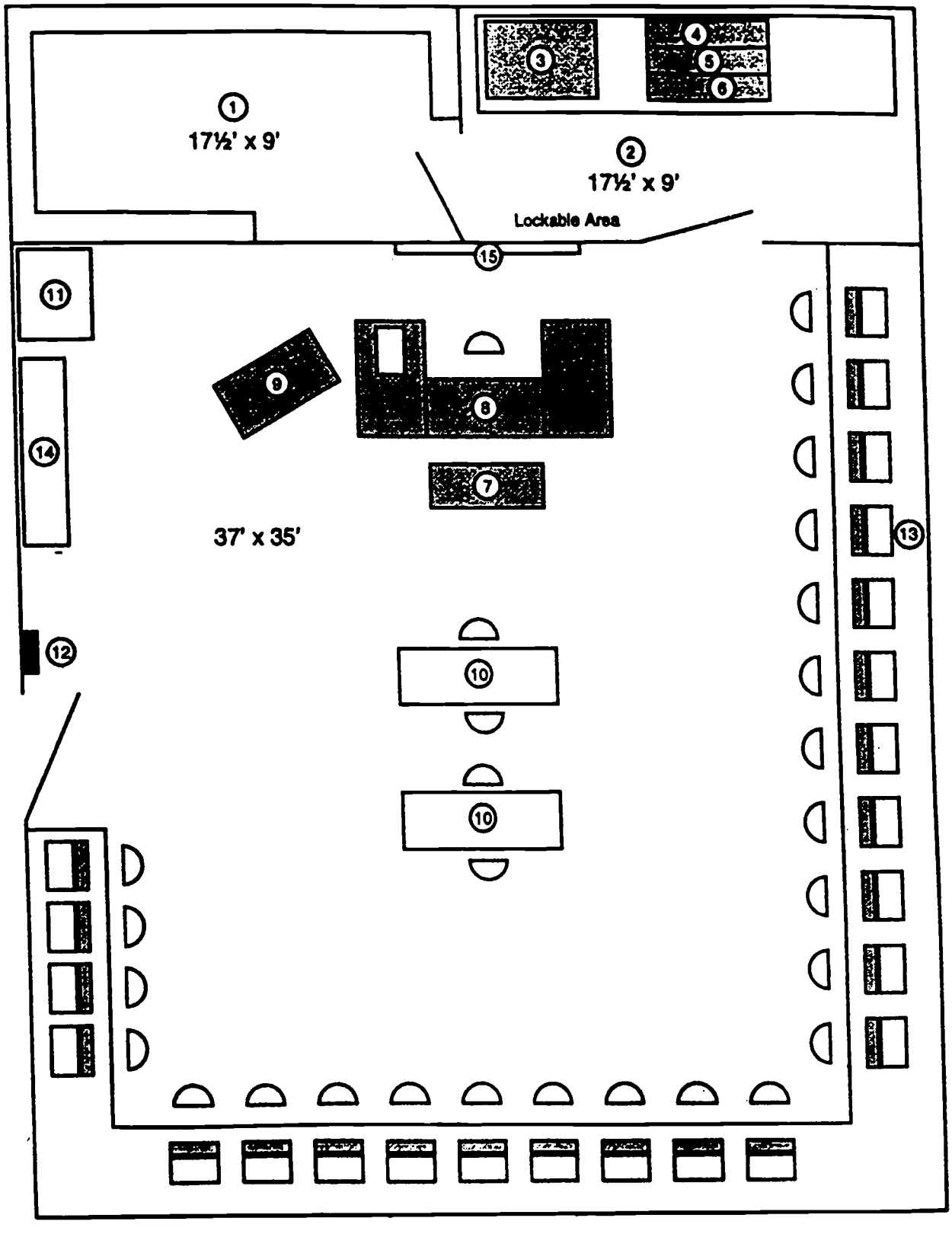


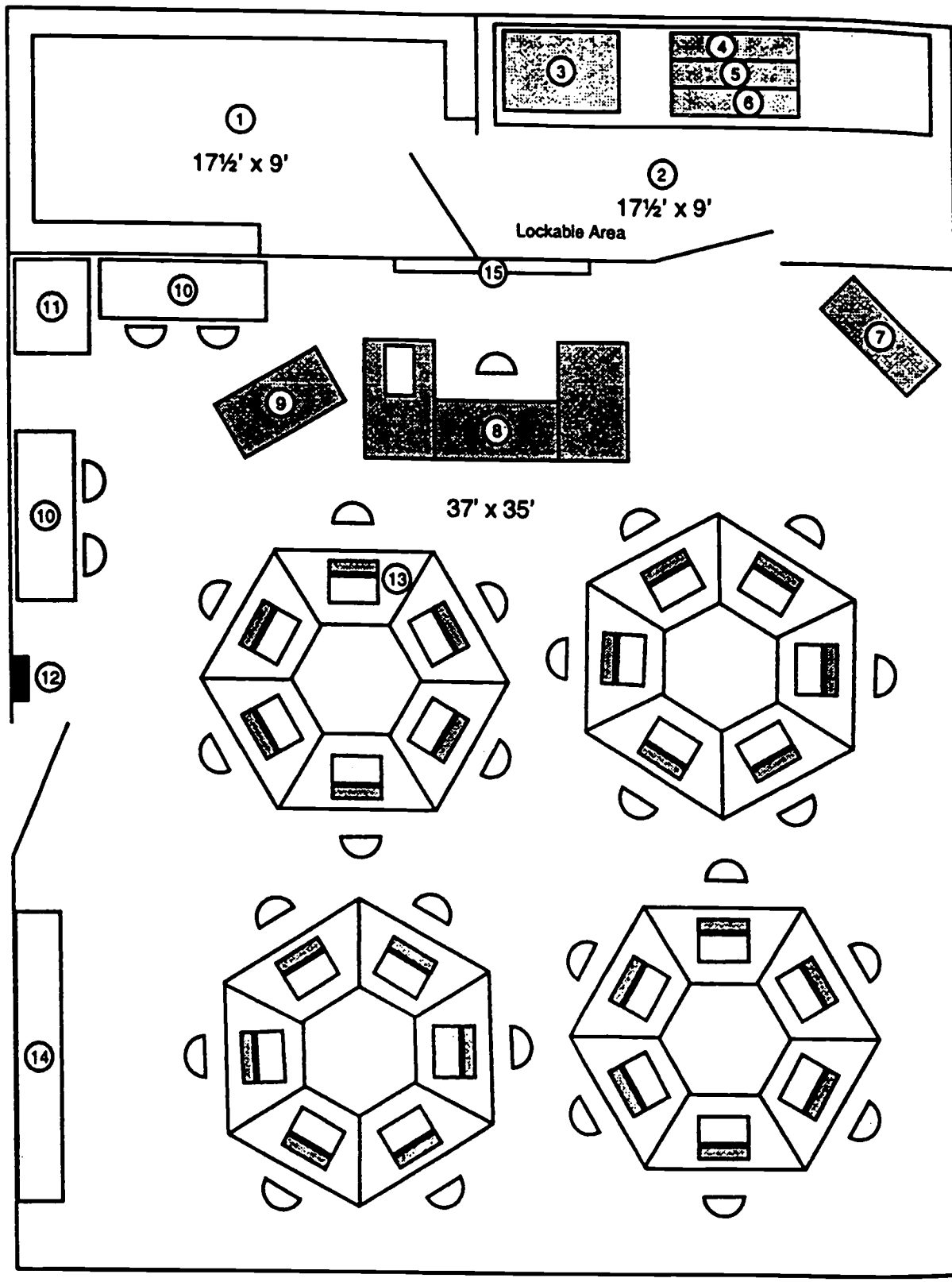
INSTRUCTIONAL TECHNOLOGY CLUSTER CLASSROOM ALTERNATIVES



INSTRUCTIONAL TECHNOLOGY CLUSTER MEDIA CENTER ALTERNATIVES




1
17½' x 9'
2
17½' x 9'
Lockable Area
3
4
5
6
7
8
9
10
10
11
12
13
14
15
37' x 35'



Appendix F
Legal Issues in Technology (with accptable use policy)

LEGAL ISSUES IN TECHNOLOGY

Idaho School Superintendents' Association Meeting

February 1996

Prepared and presented by:

ELAINE EBERHARTER-MAKI
ATTORNEY AT LAW

Elaine Eberharter-Maki Attorney at Law 777 S. Latah, Suite E Boise, Idaho 83705 208.336.8858 / Fax: 208.345.1172

LEGAL ISSUES IN TECHNOLOGY

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I. **USE OF E-MAIL**—E-mail is defined as :

"The transmission of memos and messages over a [computer] net work. . . . Users can send mail to a single recipient or broadcast it to multiple users on the system. Sophisticated systems can prompt recipients for a reply if they haven't responded within a certain time frame. With multitasking workstations, mail can be delivered and announced while the user is working in an application. Otherwise, mail is sent to a simulated postal box in the network server or host computer, which must be interrogated by the recipient." *The Computer Glossary.*

A. **PUBLIC RECORDS LAW**—Idaho Code § 9-337 *et seq.*

1. Legislative Intent—All records maintained by state and local government entities are available for public access and copying.

2. A "public record" includes, but is not limited to, any writing containing information relating to the conduct or administration of the public's business prepared, owned, used, or retained by a school district, regardless of physical form or characteristics.

   a. The Idaho Supreme Court has held that handwritten notes taken by a county clerk during a commission meeting were not "a personal notation for random observations or memoranda concerning events undertaken at a meeting" but were part of her statutory duty to record all proceedings of the commissioners. *Fox v. Estep,* 118 Idaho 454 (1990);

   b. "Working papers," "raw notes," and "preliminary drafts" are probably public records;

   c. E-mail has not been separately addressed by the Idaho Legislature. It should be considered a public record subject to the same laws as any other record of a school district.

3. A "writing" means information maintained in many forms, including typewritten or hand written documents as well as pictures, maps, tapes, magnetic or punched cards, and computer discs.

4. Every person has a right to examine and take a copy of any public record, regardless of the form the record is in.

    a. A request for a record must be granted or denied within 3 working days.

    b. If a longer time is needed the record must be provided no later than 10 working days.

    c. Failure to respond to the request is deemed a denial.

5. If a requested record contains both confidential and public information the school district must separate the confidential from the public information and make the public information available. This may require blacking out the confidential information.

6. All records retained by a school district, regardless of form, are public unless exempted under Idaho Code § 9-340. Such exempted records include:

    a. Student records;

    b. Records relating to the appraisal value of real property, timber or mineral rights, prior to its acquisition, sale or lease;

    c. Estimates prepared by a school district detailing the cost of a public project, until it is disclosed or bids are opened, or upon award of the contract;

    d. Library records that would reveal the identity of the library patron checking out, requesting, or using an item from a library;

    e. Computer programs developed or purchased by or for a school district for its own use. *Computer programs do not include:*

        i. Original data, including, but not limited to, numbers, text, voice, graphics and images;

        ii. Analysis, compilation and other manipulated forms of the original data produced by use of the program; or

        iii. Mathematical or statistical formulas that would be used if the manipulated forms of the original data were to be produced manually.

    f. Employment security information and unemployment insurance benefit information, unless all parties waive confidentiality;

    g. Records of juvenile offenders, *except* that such records shall be furnished upon request in a manner determined by the court to persons and governmental

agencies having a legitimate interest in the protection, welfare and treatment of the juvenile.

h. Records resulting in investigations made by the Idaho human rights commission, *unless* the public interest outweighs the legitimate public or private interest in maintaining confidentiality of such records.

I. All personnel records of a current or former employee except that the following is *public information:*

i. Employees' public service or employment history, classification, pay grade and step, longevity, gross salary and salary history, status, workplace and employing agency.

j. The following is *confidential* information relating to an employee or applicant:

i. Information regarding sex, race, marital status, birth date, home address and telephone number, applications, testing and scoring materials, grievances, correspondence and performance evaluations.

ii. The information set forth above cannot be released without prior written consent.

7. All e-mail messages, or other information maintained on computers used by school district personnel are public information unless an exemption applies.

8. Case law has held that the attorney-client privilege extends to e-mail communications when those communications involve legal advice. *National Employment Service Corp. v. Liberty Mutual Insurance Co.,* (Mass. Sup. Ct. Dec. 21, 1994).

9. School districts are only required to make the public records available in the form in which they are kept—there is no requirement to produce the requested information in another formate.

B. OPEN MEETING LAW—Idaho Code § 67-2340 *et seq.*

1. Legislative Intent—The formulation of public policy is public business and shall not be conducted in secret.

2. A "decision" of a public entity is any determination, action, vote or final disposition upon a motion, proposal, resolution, order, ordinance or measure on which a vote of a governing body is required, at any meeting at which a quorum is necessary to carry out a decision previously adopted in a meeting.

3. "Deliberation" is the receipt or exchange of information or opinion relating to a decision, but does not include informal or impromptu discussions of a general nature.

4. "Meeting" means the covening of a governing body to make a decision or to deliberate toward a decision on any matter.

   a. All meetings of a school board must be open to the public unless the meeting falls into an executive session exception.

   b. "Serial meetings"—contacting members of the school board one-on-one or in groups less than a quorum outside of official public meetings —has been held by an Idaho district court and the Attorney General's Office as violating the open meeting law.

   c. Using e-mail messages in a deliberate attempt to build a majority for a particular vote outside the public meeting "avoids public discussion and, at a minimum, violates the spirit of the Open Meeting Law." *Letter to Mike Wetherell*—see attached.

5. An "Executive session" may be used only for the discussion of limited topics. Notice of an executive session must be given. Minutes of executive sessions may be limited to sufficient detail to *convey the general tenor of the meeting* (ie. "To discuss a personnel matter). An executive session may be held:

   a. To consider hiring school district employees or an individual agent. An executive session may not be used to discuss the filling of a vacancy in an elective office;

   b. To consider the evaluation, dismissal or disciplining of, or to hear complaints or charges brought against an employee or individual agent, or a public school student;

   c. To conduct deliberations concerning labor negotiations or to acquire an interest in real property;

   d. To consider records that are exempt from disclosure under the Public Records Law;

   e. To consider and advise its legal representatives in pending litigation or where there is a general public awareness of probable litigation;

   f. Labor negotiations may be conducted in executive session if either side requests closed meetings. Subsequent sessions of the negotiations may continue without further public notice.

g. No executive session may be held for the purpose of taking any final action or making any final decision.

6. Violations of the public records law can occur when:

a. A board member e-mails a message to a patron and the patron then forwards the message to other patrons of the school district;

b. Board members routinely e-mail each other over public policy issues;

c. Board members have a series of communications between themselves which results in a decision;

d. A meeting is held by means of computer e-mail messages.

II. INTERNET LEGAL ISSUES

A. COPYRIGHT

1. Copyright is a right of intellectual property given to the authors granting certain exclusive rights to their works for a certain amount of time.

2. Copyright does not extend to ideas, system or factual information or pre-existing material incorporated into the work.

3. Works in the public domain fall outside copyright and can be freely used by anyone for any purpose. Once a work is in the public domain, it can never again regain copyrighted status. Works are in the public domain when:

a. The copyright has expired;

b. Items published by the U.S. Government;

c. An author voluntarily places a work in the public domain.

4. As soon as an original work is created, it's copyrighted, regardless of its location; i.e. hard drive, floppy disk, e-mail.

5. It is not necessary to register the work with the Copyright Office or provide a copyright notice for a work to be copyrighted.

a. In order to sue for infringement the work must be registered with the Copyright Office. However, the registration may occur after the infringement occurs, so long as it occurs before a lawsuit alleging infringement is filed.

LEGAL ISSUES IN TECHNOLOGY

B. THE FAIR USE DOCTRINE

1. The "fair use" doctrine allows use of a copyrighted work without the permission of the copyright holder.

2. "Fair use" originated "for purposes such as criticism, comment, news reporting, *teaching, . . .*"

3. Courts have upheld the following to be "fair use":

   a. Quotation of excerpts in a review or criticism for purposes of illustration or comment;

   b. Quotation of short passages in a scholarly or technical work for illustration or clarification of the author's observations;

   c. Use in a parody of some of the content of the work parodied;

   d. Summary of an address or article with brief quotations, in a news report;

   f. Reproduction by a library of a portion of a work to replace part of a damaged copy;

   g. *Reproduction by a teacher or student of a small part of a work to illustrate a lesson;*

4. Four factors are used in determining whether use of a copyrighted work falls within "fair use":

   a. The purpose and character of the use, including whether such use is of a commercial nature or is for *nonprofit educational purposes;*

   b. The nature of the copyrighted work;

   c. The amount and substantiality of the portion used in relation to the copyrighted work as a whole; and

   d. The effect of the use upon the potential market for or value of the copyrighted work. (17 U.S.C. 107)

5. The U.S. Supreme Court has held that the effect upon the potential market is "undoubtedly the single most important element of fair use." *Harper and Row v. National Enterprises,* 471 U.S. 539 (1985).

6. Guidelines adopted by an Ad Hoc Committee are included in the official comments on the copyright statute and list a number of specific exceptions for teachers. In particular, the guidelines consist of *brevity, spontaneity* and *cumulative effect.*

LEGAL ISSUES IN TECHNOLOGY

C. COPYRIGHT AS IT APPLIES TO THE INTERNET

1. Since all written materials should be presumed copyrighted, only those items that fall within the "fair use" doctrine should be downloaded and printed off, without the authors' approval.

2. If a school is developing a home page on the Internet, the following should be taken into account:

   a. The "fair use" doctrine probably does not come into play for home pages since such use of copyrighted materials does not meet the 4-prong test, nor the Ad Hoc Committee's guidelines of brevity, spontaneity and cumulative effect.

   b. Pictures from magazines or books should not be scanned, since they are copyrighted by the publisher. If considering using a photograph, make sure the owner has given permission;

   c. Posting e-mail is technically a violation, but revealing facts from e-mail is not.

   d. See attached article entitled *10 Big Myths About Copyright Explained* authored by Brad Templeton, a publisher of an electronic newspaper on the Internet located at http://www.clarinet.com/brad/copymyths.html for answers to common myths about copyright issues and the net.

D. SCHOOL DISTRICT POLICY—See attached.

1. In writing a policy dealing with e-mail it is important to remember:

   a. E-mail sent across the Internet or intra district is not confidential.

      i. Computer experts can retrieve e-mail thought to have been erased long ago;

      ii. E-mail passes through several other locations electronically before it is sent;

      iii. Never type anything into e-mail that you do not want other people to see.

   b. A formal policy should be adopted to address the use of e-mail;

   c. Employees and students should be instructed on drafting appropriate e-mail messages;

   d. An e-mail system should be organized so that important and potentially privileged documents can easily be retrieved.

E. COMPUTER ETHICS—TEN COMMANDMENTS

1. Thou shalt not use a computer to harm other people;
2. Thou shalt not interfere with other people's computer work;
3. Thou shalt not snoop around in other people's files;
4. Thou shalt not use a computer to steal;
5. Thou shalt not use a computer to bear false witness;
6. Though shalt not use or copy software for which you have not paid;
7. Thou shalt not use other people's computer resources without authorization;
8. Thou shalt not appropriate other people's intellectual output;
9. Thou shalt think about the social consequences of the program you write;
10. Thou shalt use a computer in ways that show consideration and respect.

(Source: *"The Net User Guidelines and Etiquette"* written by Arlene H. Rinaldi, as set forth in the *CyberHighway Internet News Magazine.*

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June 17, 1994

Mr. Mike Wetherell
HYDE, WETHERELL, BRAY, HAFF & FRENCH
Owyhee Plaza, Suite 500
1109 Main Street
Boise, ID 83702

Dear Mr. Wetherell:

You have requested an opinion from this office whether the use of an electronic mail system (e-mail) could, in some manner, violate Idaho's Open Meeting Law. You also ask what precautions should be taken to safeguard e-mail use from violating the Open Meeting Law.

Electronic mail systems have become common in today's office environment. In practice, e-mail systems have replaced paper memoranda and have facilitated communication via split-second transmissions. E-mail has been described in layman's terms by Alan Freedman in The Computer Glossary:

> The transmission of memos and messages over a [computer] net work. . . . Users can send mail to a single recipient or broadcast it to multiple users on the system. Sophisticated systems can prompt recipients for a reply if they haven't responded within a certain timeframe. With multitasking workstations. mail can be delivered and announced while the user is working in an application. Otherwise, mail is sent to a simulated postal box in the network server or host computer, which must be interrogated by the recipient.

E-mail is a technological development that has not been specifically addressed by the Idaho Legislature in relation to Idaho's Open Meeting Law. Idaho Code §§ 67-2340 through 67-2347. Moreover. the nature of e-mail communication does not lend itself to the statutory framework of an open "meeting," *i.e.*, "the convening of a governing body of

a public agency to make a decision or to deliberate toward a decision on any matter." Idaho Code § 67-2341(6). It is just the opposite: e-mail communications facilitate the exchange of information very efficiently without having to meet person-to-person. Therein lies the rub. Technology is rapidly making personal contact in the nature of a face-to-face "meeting" obsolete.[1]

The ease with which technology has provided a means to avoid discussing public business at public meetings raises serious questions in relation to Idaho's Open Meeting Law. In this regard, the use of e-mail messages in a serial manner to line up votes in advance of a meeting is the most obvious potential problem.

By letter dated May 23, 1994, this office addressed serial meetings in relation to Idaho's Open Meeting Law. As we understand the concept of "serial meetings," it is the practice of contacting members of a public agency one-on-one or in groups less than a quorum, outside of official public meetings, in a deliberate attempt to build a majority for or against a public policy or proposed ordinance. In our letter, this office reviewed several appellate decisions from outside this state which held that such conduct did indeed violate those states' open meeting laws. Within Idaho, one state district court has recently held that singular contacts by a mayor of a city with members of the city council in order to build a consensus on an issue before the council and to avoid public discussion at a public meeting did violate the Open Meeting Law. Thus, after reviewing the relevant case law in relation to serial meetings, this office concluded that serial meetings, if used to forge a majority decision outside of the public forum, violate at least the spirit of Idaho's Open Meeting Law.

Turning to e-mail correspondence, there is no doubt that e-mail messages could be used to "contact members of a public agency one on one or in groups less than a quorum, outside of official public meetings, in a deliberate attempt to build a majority for or against a public policy or proposed ordinance." For example, a mayor of a city could poll the city council via e-mail on an issue before the council prior to the meeting, such as, "Are we in agreement that we should approve the zone changes recommended by the city planning and zoning commission?" Replies could be sent back and forth by e-mail to the extent that no public discussion in a public forum would be necessary and the actual voting at the public meeting would be but a ceremonial acceptance of what was already a

[1]Some communication systems allow all users to get on-line at once and "chat" with one another. If a quorum of the members of a governmental entity were to communicate in this way, it would, of course, be a direct violation of the Open Meeting Law just as if the members had a telephone conference call.

"done deal." As noted previously, this type of conduct on matters of public concern avoids public discussion and, at a minimum, violates the spirit of the Open Meeting Law.

In response to your question as to what safeguards should be put in place to avoid violating the Open Meeting Law, there are really none that are unique to e-mail. The mode of communication is not as relevant as the process of communication itself. If the message, whether by telephone, e-mail or in person, is a deliberate attempt to forge a majority consensus for or against a matter pending before the public body, a problem exists. E-mail has simply made that possibility incredibly easy.

Yours very truly,

FRANCIS P. WALKER
Deputy Attorney General

FPW/lp

\L41611WB

ClariNet * *Brad Templeton Home Page* * *10 Big Myths about copyright explained*

10 Big Myths about copyright explained

An attempt to answer common myths about copyright seen on the net and cover issues related to copyright and USENET posting.

1) "If it doesn't have a copyright notice, it's not copyrighted."

This was true in the past, but today almost all major nations follow the Berne copyright convention. For example, in the USA, almost everything created privately and originally after April 1, 1989 is copyrighted and protected whether it has a notice or not. The default you should assume for other people's works is that they are copyrighted and may not be copied unless you **know** otherwise. There are some old works that lost protection without notice, but frankly you should not risk it unless you know for sure.

It is true that a notice strengthens the protection, by warning people, and by allowing one to get more and different damages, but it is not necessary. If it looks copyrighted, you should assume it is. This applies to pictures, too. You may not scan pictures from magazines and post them to the net, and if you come upon something unknown, you shouldn't post that either.

The correct form for a notice is:

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"Copyright [dates] by [author/owner]"
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You can use C in a circle © instead of "Copyright" but "(C)" has never been given legal force. The phrase "All Rights Reserved" used to be required in some nations but is now not needed.

2) "If I don't charge for it, it's not a violation."

False. Whether you charge can affect the damages awarded in court, but that's essentially the only difference. It's still a violation if you give it away -- and there can still be heavy damages if you hurt the commercial value of the property.

3) "If it's posted to Usenet it's in the public domain."

False. Nothing is in the public domain anymore unless the owner explicitly puts it in the public domain(*). *Explicitly*, as in you have a note from the author/owner saying, "I grant this to the public domain." Those exact words or words very much like them.

Some argue that posting to Usenet implicitly grants permission to everybody to copy the posting within fairly wide bounds, and others feel that Usenet is an automatic store and forward network where all the thousands of copies made are done at the command (rather than the consent) of the poster. This is a matter of some debate, but even if the former is true (and in this writer's opinion we should all pray it isn't true) it simply would suggest posters are implicitly granting permissions "for the sort of copying one might expect when one posts to Usenet" and in no case is this a placement of material into the public domain. Furthermore it is very difficult for an implicit licence to supersede an explicitly stated licence that the copier was aware of.

Note that all this assumes the poster had the right to post the item in the first place. If the poster didn't, then all the copies are pirate, and no implied licence or theoretical reduction of the copyright can take place.

(*) Copyrights can expire after a long time, putting something into the public domain, and there are some fine points on this issue regarding older copyright law versions. However, none of this applies to an original article posted to USENET.

Note that granting something to the public domain is a complete abandonment of all rights. You can't make something "PD for non-commercial use." If your work is PD, other people can even modify one byte and put their name on it.

4) "My posting was just fair use!"

See other notes on fair use for a detailed answer, but bear the following in mind:

The "fair use" exemption to copyright law was created to allow things such as commentary, parody, news reporting, research and education about copyrighted works without the permission of the author. Intent, and damage to the commercial value of the work are important considerations. Are you reproducing an article from the New York Times because you needed to in order to criticise the quality of the New York Times, or because you couldn't find time to write your own story, or didn't want your readers to have to pay to log onto the online services with the story or buy a copy of the paper? The first is probably fair use, the others probably aren't.

Fair use is almost always a short excerpt and almost always attributed. (One should not use more of the work than is necessary to make the commentary.) It should not harm the commercial value of the work -- in the sense of people no longer needing to buy it (which is another reason why reproduction of the entire work is generally forbidden.)

Note that most inclusion of text in Usenet followups is for commentary and reply, and it doesn't damage the commercial value of the original posting (if it has any) and as such it is fair use. Fair use isn't an exact doctrine, either. The court decides if the right to comment overrides the copyright on an indidvidual basis in each case. There have been cases that go beyond the bounds of what I say above, but in general they don't apply to the typical net misclaim of fair use. It's a risky defence to attempt.

5) "If you don't defend your copyright you lose it."

False. Copyright is effectively never lost these days, unless explicitly given away. You may be thinking of trade marks, which can be weakened or lost if not defended.

6) "Somebody has that name copyrighted!"

You can't "copyright a name," or anything short like that. Titles usually don't qualify, but I doubt you could write a song entitled "Everybody's got something to hide except for me and my monkey." (J.Lennon/P.McCartney)

You can't copyright words, but you can trademark them, generally by using them to refer to your brand of a generic type of product or service. Like an "Apple" computer. Apple Computer "owns" that word applied to computers, even though it is also an ordinary word. Apple Records owns it when applied to

music. Neither owns the word on its own, only in context, and owning a mark doesn't mean complete control -- see a more detailed treatise on this law for details.

You can't use somebody else's trademark in a way that would unfairly hurt the value of the mark, or in a way that might make people confuse you with the real owner of the mark, or which might allow you to profit from the mark's good name. For example, if I were giving advice on music videos, I would be very wary of trying to label my works with a name like "mtv." :-)

7) "They can't get me, defendants in court have powerful rights!"

Copyright law is mostly civil law. If you violate copyright you would usually get sued, not charged with a crime. "Innocent until proven guilty" is a principle of criminal law, as is "proof beyond a reasonable doubt." Sorry, but in copyright suits, these don't apply the same way or at all. It's mostly which side and set of evidence the judge or jury accepts or believes more, though the rules vary based on the type of infringement. In civil cases you can even be made to testify against your own interests.

8) "Oh, so copyright violation isn't a crime or anything?"

Actually, recently in the USA commercial copyright violation involving more than 10 copies and value over $2500 was made a felony. So watch out. (At least you get the protections of criminal law.) On the other hand, don't think you're going to get people thrown in jail for posting your E-mail. The courts have much better things to do than that. This is a fairly new, untested statute.

9) "It doesn't hurt anybody -- in fact it's free advertising."

It's up to the owner to decide if they want the free ads or not. If they want them, they will be sure to contact you. Don't rationalize whether it hurts the owner or not, ask them. Usually that's not too hard to do. Time past, ClariNet published the very funny Dave Barry column to a large and appreciative Usenet audience for a fee, but some person didn't ask, and forwarded it to a mailing list, got caught, and the newspaper chain that employs Dave Barry pulled the column from the net, pissing off everybody who enjoyed it. Even if you can't think of how the author or owner gets hurt, think about the fact that piracy on the net hurts everybody who wants a chance to use this wonderful new technology to do more than read other people's flamewars.

10) "They e-mailed me a copy, so I can post it."

To have a copy is not to have the copyright. All the E-mail you write is copyrighted. However, E-mail is not, unless previously agreed, secret. So you can certainly **report** on what E-mail you are sent, and reveal what it says. You can even quote parts of it to demonstrate. Frankly, somebody who sues over an ordinary message might well get no damages, because the message has no commercial value, but if you want to stay strictly in the law, you should ask first. On the other hand, don't go nuts if somebody posts E-mail you sent them. If it was an ordinary non-secret personal letter of minimal commercial value with no copyright notice (like 99.9% of all E-mail), you probably won't get any damages if you sue them. Note as well that the law aside, keeping private correspondence private is a courtesy one should usually honour.

In Summary

- ☐ These days, almost all things are copyrighted the moment they are written, and no copyright notice is required.
- ☐ Copyright is still violated whether you charged money or not, only damages are affected by that.
- ☐ Postings to the net are not granted to the public domain, and don't grant you any permission to do further copying except **perhaps** the sort of copying the poster might have expected in the ordinary flow of the net.
- ☐ Fair use is a complex doctrine meant to allow certain valuable social purposes. Ask yourself why you are republishing what you are posting and why you couldn't have just rewritten it in your own words.
- ☐ Copyright is not lost because you don't defend it; that's a concept from trademark law. The ownership of names is also from trademark law, so don't say somebody has a name copyrighted.
- ☐ Copyright law is mostly civil law where the special rights of criminal defendants you hear so much about don't apply. Watch out, however, as new laws are moving copyright violation into the criminal realm.
- ☐ Don't rationalize that you are helping the copyright holder; often it's not that hard to ask permission.
- ☐ Posting E-mail is technically a violation, but revealing facts from E-mail you got isn't, and for almost all typical E-mail, nobody could wring any damages from you for posting it.

It should be noted that the author, as publisher of an electronic newspaper on the net, makes his living by publishing copyrighted material in electronic form and has the associated biases. However, **DO NOT E-MAIL HIM FOR LEGAL ADVICE**; for that use other resources or consult a lawyer. Also note that while most of these principles are universal in Berne copyright signatory nations, some are derived from Canadian and U.S. law. This document is provided to clear up some common misconceptions about intellectual property law that are often seen on the net. It is not intended to be a complete treatise on all the nuances of the subject. A more detailed copyright FAQ, covering other issues including compilation copyright and more intricacies of fair use is available in the same places you found this note. Also consider The LoC Gopher for actual U.S. statutes. Australians try this. This site has Canadian Copyright Info. Another useful document is the EFF's IP law primer.

Other net articles on my Home Page

Up to ClariNet e.News home page

POLICY TITLE: Computer Network Service **POLICY NO: 663**
PAGE 1 of 6

GENERAL

Computer network service through the Internet provides an electronic highway connecting millions of computers around the world. Students and staff can access information and news from educational and research institutions, send and receive electronic mail (E-mail), take part in distance learning activities, consult with experts, and view library holdings by using the Internet.

Internet access is a service provided by this district. The system administrators of the computer network service are employees of this district and reserve the right to monitor all activity on the computer network service. On acceptance for usage of the computer network service, students and staff will be given a user ID (name) and password.

Users may encounter information on the Internet and other computer network service that may be perceived as controversial or potentially harmful. Because of the changing information and sources of information on such computer network service, it is impossible to monitor the content. This school district can not control the Internet and other computer network service sources of information. Rather, this district will strive to provide students with the understanding and skills needed to use computer network services in an appropriate manner.

PRIVILEGES AND RESPONSIBILITIES

The use of this district's computer networking capabilities is a privilege, not a right. Permission from parents or guardians is required before students may access the computer network services. All school district users must sign an Acceptable Use Agreement before access is permitted.

Student and staff freedom of speech and access to information will be honored; however, this school district reserves the right to monitor and review all electronic transmissions and activities. Access may be denied, revoked, or suspended to specific school district users at any time because of inappropriate use. Further disciplinary action may also occur.

Usage of this district's computer networking capabilities must be directly related to education consistent with the instructional objectives of this district.

INFORMATION CONTENT

This school district provides students and staff access to other computer systems around the world through the Internet. This district and its administrators do not have control of the content of information that may be found in other computer systems. Some computer systems may contain defamatory, inaccurate, abusive, obscene, profane, sexually oriented, threatening, racially offensive, or illegal materials. This district does not condone the use of such materials and does not knowingly permit usage of such materials in the school environment. Parents of students

should be aware that such materials exist. Students bringing such materials into the school environment will be dealt with according to the discipline policies of the individual school building and this district. Intentionally accessing or using such materials may result in termination of access to this district's computer network servicing capacities as well as in-school suspension, suspension from school or school expulsion; or disciplinary actions to staff, including termination.

The computer network services provided by this district may not always meet students or staff requirements or be uninterrupted or error-free. It is provided on an "as is, as available" basis. No warranties are made or given with respect to any service and any information or software contained therein.

ONLINE USE

All school policies and rules pertaining to behavior and communications apply. The use of this district's computer network services capabilities must be for educational purposes only and be consistent with this district's mission.

1. Usage may not be for private or commercial purposes. Users shall not attempt to sell or offer for sale any goods or services that could be construed as a commercial enterprise.

2. Illegal activity is prohibited.

   a. Sending, receiving, or accessing obscene or pornographic material is prohibited.

   b. Sending, receiving, or accessing harassing or objectionable material is prohibited.

3. Using programs to infiltrate a computing system and/or damage the software components is prohibited.

4. Students and staff shall use the computer network service resources efficiently to minimize interference with others.

5. Users are responsible for making back-up copies as needed.

6. Users are responsible for taking precautions against computer viruses on their own equipment and this school district's equipment.

ONLINE CONDUCT

All users are expected to abide by the generally accepted rules of computer network service etiquette. These include, but are not limited to, the following:

a. Users may not be abusive in their messages to others.

b. Users may not swear, use vulgarities or any other inappropriate language.

c. Users may not reveal personal information of others and should be cautious when revealing users' own personal information (home address, phone number, etc.).

d. The computer network service may not be used in such a way that usage would disrupt the use of the computer network service by others.

e. All communications and information accessible via the computer network service should be assumed to be private property but open to school district scrutiny.

f. Users shall not submit, publish, or display any defamatory, inaccurate, abusive, obscene, profane, sexually oriented, threatening, racially offensive, or illegal material nor may they encourage the use of controlled substances.

g. Users shall not transmit materials, information or software in violation of any local, state or federal law.

h. Attempts to login to the system using another user's account shall result in termination of the user's account.

Any action by a school district user that is determined by the designated administrator to constitute an inappropriate use of this district's computer network service or to improperly restrict or inhibit other users from using and enjoying the this district's computer network service is strictly prohibited and may result in disciplinary action.

COPYRIGHTED MATERIAL

Copyrighted material shall not be placed on any system connected to this district's computer network service without the author's written permission. The following shall apply to copyrighted materials:

1. Only the owner(s) or persons specifically authorized may upload copyrighted material to the computer network service.

2. Users may download only that copyrighted material for which permission has been requested and granted, or that falls within the fair use exception to the copyright laws.

3. A user may redistribute a copyrighted program only with the express written permission of the owner or authorized person or as provided by the fair use exception.

agencies having a legitimate interest in the protection, welfare and treatment of the juvenile.

h. Records resulting in investigations made by the Idaho human rights commission, *unless* the public interest outweighs the legitimate public or private interest in maintaining confidentiality of such records.

I. All personnel records of a current or former employee except that the following is *public information:*

i. Employees' public service or employment history, classification, pay grade and step, longevity, gross salary and salary history, status, workplace and employing agency.

j. The following is *confidential* information relating to an employee or applicant:

i. Information regarding sex, race, marital status, birth date, home address and telephone number, applications, testing and scoring materials, grievances, correspondence and performance evaluations.

ii. The information set forth above cannot be released without prior written consent.

7. All e-mail messages, or other information maintained on computers used by school district personnel are public information unless an exemption applies.

8. Case law has held that the attorney-client privilege extends to e-mail communications when those communications involve legal advice. *National Employment Service Corp. v. Liberty Mutual Insurance Co.,* (Mass. Sup. Ct. Dec. 21, 1994).

9. School districts are only required to make the public records available in the form in which they are kept—there is no requirement to produce the requested information in another formate.

B. OPEN MEETING LAW—Idaho Code § 67-2340 *et seq.*

1. Legislative Intent—The formulation of public policy is public business and shall not be conducted in secret.

2. A "decision" of a public entity is any determination, action, vote or final disposition upon a motion, proposal, resolution, order, ordinance or measure on which a vote of a governing body is required, at any meeting at which a quorum is necessary to carry out a decision previously adopted in a meeting.

SECURITY

Security on any computer system is a high priority. All school district users shall meet the following requirements:

1. If a user feels that he/she can identify a security problem on the computer network service, the user shall notify a school administrator. The user shall not demonstrate the problem to others.

2. Users may not let others use their account and password nor shall they leave their account open or unattended.

3. Users shall change passwords regularly, using combinations of letters and numbers and shall avoid using standard English words and names.

4. Users shall immediately notify a school administrator if their password is no longer secure, or if they have reason to believe that someone has obtained unauthorized access to their account.

5. Any user identified as a security risk or having a history of problems with other computer systems may be denied access to the computer network service.

VANDALISM

Vandalism will result in disciplinary actions. Vandalism is defined as any malicious attempt to harm or destroy data of another users, the computer network service, or any of the agencies or other computer network service that are connected to the Internet. This includes, but is not limited to, the uploading or creation of computer viruses.

STUDENT DISCIPLINE

Violation of this policy may result in the following disciplinary actions:

1. First offense: A student will lose computer privileges/network service access until a parent conference is held.

2. Second offense: A student may lose computer privileges/network service assess for one (1) month.

3. Third offense: A student has exhibited a pattern of abuse or flagrant violations. Any student who, after the first and second offenses, continues to engage in serious or persistent misbehavior by violating this policy may lose all computer privileges/network service access for the remainder of the school year.

4. Students may be suspended or expelled from school if he/she engages in conduct on the computer network service that could be considered criminal, as defined by federal and/or state law. Students committing criminal acts may be prosecuted. Expulsion may be considered for flagrant violations that of this policy.

5. Each student is responsible for any damage he/she may cause to this district's computers or to the computer network service. The student must pay all costs incurred in restoring the computer or the network service to its previous working order.

6. If a class requires the use of a computer and/or the computer network service, a student who has lost computer privileges under this policy will be allowed to participate under direct teacher supervision.

UPDATING USER ACCOUNT INFORMATION

The computer network service may occasionally require new registration and information from users to continue the service. Users must notify the designated administrator of any changes/deletions in user information (address, phone, name, etc.).

TERMINATION OF ACCOUNT

A users' access to, and use of, the computer network service may be terminated at any time by the users by notifying a system administrator. Accounts which are inactive for more than 30 days may be removed along with that users' files without notice given to the users.

An administrator reserves the right, at their sole discretion, to suspend or terminate users' access to and use of the computer network service upon any violation of this policy.

This district's administration, faculty and staff may request the system administrator to deny, revoke, or suspend specific user access.

✦✦✦✦✦✦✦

LEGAL REFERENCE:
17 U.S.C. Section 101 *et seq.*

ADOPTED: March, 1996

(Adapted from the Boise School District and Moscow School District internet policies)

COMPUTER NETWORK SERVICE USER AGREEMENT

I understand and will abide by this district's policy entitled Computer Network Service. Should I commit any violation of the policy, my access privileges may be revoked, school disciplinary and/or appropriate legal action may be taken.

User Signature: _____ Date: _____ / ____ / ____

PARENT OR GUARDIAN (If you are under the age of 18, a parent or guardian must also read and sign this agreement.)

As the parent or guardian of this student, I have read this district's policy entitled Computer Network Service. I understand that this access is designed for educational purposes and this district has taken available precautions to eliminate controversial material. **However, I also recognize it is impossible for this district to restrict access to all controversial materials and I will not hold them responsible for materials acquired on the computer network service.** Further, I accept full responsibility for supervision if and when my child's use is not in a school setting. I hereby give permission to issue an account for my child and certify that the information contained on this form is correct.

Parent or Guardian (please print): _____

Signature: _____ Date: _____ / ____ / ____

User's Full Name (please print): _____

School: _____ Grade: _____

Home Address: _____

Home Phone: _____ Work Phone: _____

I am a....

☐ Student of this district and will graduate in _____.

☐ Teacher of this district, teaching _____
in grade _____ at _____

☐ Staff user of this district working as a _____

Appendix G
Creating and Supporting Networks

Networking

A network is a collection of independent computers which can communicate with one another over a shared medium. There are different types of networks; Ethernet, Token Ring, etc, which incorporate specific physical mediums, standards, protocols, and topologies. The most common type of networks are: Local Area Networks and Wide Area Networks. A LAN normally covers a small geographical area, such as, connecting computers and peripherals on several floors of a building to a common central computer(s) (called the 'File Server') in order for users to share the same software, printers, mass storage, and other devices. A WAN (similar in operation to a local area network) connects separate and disparate networks to each other; using special equipment, such as bridges and routers, and spans a large geographical area (campus', cities, globally).

Physical Mediums -

Coaxial (thick wire) - is a thick, relatively inflexible cable that consists of an inner hollow cylindrical conductor (usually copper) surrounded by an insulator and then encased in a wire mesh or metal sheath. Coaxial cable is used for baseband and broadband communications networks including local and wide area networks. Thick coaxial is used because of its immunity to common levels of electrical noise, helping to ensure the integrity of network signals. Thick coaxial, or 10BASE5 Ethernet, is generally used to create large backbones. A network backbone joins many smaller network segments into one large LAN. Thick coaxial is best suited for, but not limited to, backbone applications, and is normally used in the bus topology.

Thin Coax (cheapernet) - cable is considerably thinner (0.2-inch) and more flexible than ThickWire. Thin coax, or 10BASE2 Ethernet, offers many of the advantages of ThickWire's bus topology with lower cost and easier installation. Thin coax's low cost, reconfigurability, and bus topology make it an attractive medium for small networks, for building departmental networks to connect to backbones and for wiring a number of nodes together in the same room, such as a computer lab.

Twisted Pair - unshielded twisted pair, or UTP, cable offers many advantages over the ThickWire and thin coax media. Because ThickWire and thin coax are coaxial cables, they are relatively expensive and require some care during installation. UTP is similar to, if not the same as, the telephone cable that may already be installed and available for network use in a building. UTP, or 10BASE-T Ethernet comes in a variety of grades, with each higher grade offering better performance. UTP, or 10BASE-T Ethernet, uses a star topology where a computer is located on one end of the segment, and the other end is terminated in a central location with a repeater or hub. Since UTP is often run in conjunction with telephone cabling, this central location can be a telephone closet or other area where it is convenient to connect the UTP segment to a backbone. UTP's point-to-

point nature allows the rest of the network to function correctly if a break occurs in a particular segment which makes it a more attractive and viable option than a bus or ring topology.

Fiber Optic - is a plastic or glass fiber made from silicon dioxide no thicker than a human hair. Fiber optics use a light beam, which is an electromagnetic signal, that provides for transmission of information at very high frequencies, requiring an infra-red or even visible light range as the carrier (usually a laser). Fiber Optic, or 10BASE-FL Ethernet, is more expensive but is invaluable for situations where electronic emissions and environmental hazards are a concern. Fiber optic cables effectively insulate networking equipment from these conditions since they do not conduct electricity. As network technologies evolve and the demands on a network increase, FDDI and other technologies faster than Ethernet can be run on the same cable, avoiding major rewiring.

Topologies - are the ways in which local area networks are designed, wired, and arranged, and how the devices connected to the network are able to communicate and to share and exchange information and resources.

Bus - consists of one continuous cable to which devices are connected. Each device is considered to be connected to every other device, and can communicate directly along the network to any device. In a bus network, a message from the originating node is broadcast along the bus to all attached devices. The message is addressed so that the intended receiver will recognize its address and respond to the message. A break anywhere in the cable will usually cause the entire segment to be inoperable until the break is repaired.

Star - is where each device is connected to a central unit called a 'hub' or 'controller' through which all data passes. All users all usually connected to a central host computer. Star networks use time-sharing systems which allocate a certain amount of time for each user. The primary advantage of this type of network is reliability. Any defective nodes can be quickly isolated with the exception of the controlling node (hub, controller) which will usually render the whole network inoperative. In this scenario if a node (PC) fails, or a cable fault occurs, the problem with only affect the node while the network continues to operate as if that node were non-existent. Star networks are easily controlled and well suited to both voice and data transmission.

Ring - is where each node is connected in a continuous series to form a closed loop. Each node is connected to exactly two other stations in a point to point link . Because a host computer is not required, ring topologies perform distributed data processing, meaning each device performs its own processing. When one device requests information from a computer in the network, data cannot be sent directly to the requesting device, but must travel in a loop around the ring in a serial bit stream along a unidirectional path until it reaches its destination. Messages circulate on the ring in only one direction and are regenerated as they pass through each node.

Protocols - are a strict set of rules that govern the exchange of information between computer devices. They are a set of semantic and syntactic rules that determines the behavior of functional units in achieving communication. A typical protocol defines how computers should identify one another on a network, the form that the data should take in transit, and how this information should be processed once it reaches its final destination. Protocols also define procedures for handling lost or damaged transmissions or "packets." Although there are several different and unique network protocols, they all use the physical cabling in the same manner. This common method of accessing the physical network allows multiple protocols to peacefully coexist, and allows the builder of a network to use common hardware for a variety of protocol.. This concept is known as "protocol independence," meaning that the physical network doesn't need to concern itself with the protocols being carried. Two major protocols are described below.

IPX/SPX - (Internetwork Packet Exchange) is a Novell communication protocol which addresses and routes outgoing packets across a network. It reads the assigned addresses of returning data and directs the data to the proper area within the workstation's or file server's operating system. IPX is closely linked with other programs and routines that help in the network data-transmission process.

SPX (Sequenced Packet Exchange) works in conjunction with IPX by monitoring network transmissions to ensure successful delivery. SPX verifies and acknowledges successful packet delivery to any network destination by requesting a verification from the destination that the data was received.

TCP/IP - (Transmission Control Protocol/Internet Protocol) is a popular suite of standard networking protocols. These protocols enable dissimilar nodes in a heterogeneous environment to communicate with one another. The TCP/IP suite of protocols defines formats and rules for the transmission and receipt of information independently of any given network organization or computer hardware. Although the protocols were developed for the Internet, they are also applicable to other cases where networks must be connected. The TCP/IP protocols define the format of packets, including the origin of the packet, the destination of the packet, the length of the packet, and the type of the packet, as well as the way computers on the networks are to receive and retransmit packets as necessary.

Standards - are clearly-defined and agreed upon conventions for specific programming interfaces. Standards may be proprietary (used only within the environment provided by a single computer vendor), public (widely used across a variety of vendor equipment) or formal (developed by a standards organization such as the American National Standards Institute or the International Organization for Standardization). Standardization is critical for the exchange of data between different vendors' equipment (using facilities supplied by different common carriers) in different countries.

This requires agreement between the vendors and common carriers on the methods of presentation and expression (character sets and languages). For efficient widespread exchange of data, a set of universal standards is required. International and national standards have developed over the years in response to changing technology and the increased demand placed on communication systems.

Hardware - are the electronic physical devices which compose the network architecture. There are many devices, of varying configurations, which provide various functions within the network environment.

File Server - in local area networking this is usually a minicomputer or powerful personal computer, which is allocated the task of servicing users with data, application software, mass storage, print services and other utilities. The file service function allows multiple access from users to individual records on a shared basis. The operating system that provides the functions and services must incorporate multitasking and multi-user features.

Nodes (Personal Computers/Workstations) - in general terms, a node refers to a personal computer connected to a network. In local area networking, a computer, repeater, file server, or similar peripheral device is termed a node.

NIC's (Network Interface Cards)/Transceivers - are communication cards installed in personal computers in order to connect directly to a local area network. The network interface card is designed to communicate directly with the internal bus of a personal computer. A transceiver is a similar device which provides the electrical and physical interface to a network cable. Both these devices are used to transmit and receive data.

Hubs/Concentrators - a hub is a multiple port "switchboard" connecting LAN segments and passing data to and from specific segments. The ports within the hub provide the individual connection for personal computers. Concentrators are programmable devices which act as communication control units by directing traffic, buffering, multiplexing, and polling.

Bridges - are devices in a local area network which will receive, regenerate, and retransmit packets that are addressed to stations other than those attached to the same local network. Bridges are used to interconnect LANs that are using the same media and a common protocol. This approach assumes that the networks to be interconnected define a consistent addressing scheme. They do not support protocol conversion or code conversion. Bridges monitor all traffic on the two sub-networks that it links, and allows two networks to communicate, even though they may have different topologies or communications protocols.

Routers - are used to transfer data packets from a particular station on a LAN to a remote station that is attached to another LAN. Routers work in a manner similar to switches and bridges in

that they filter out network traffic. Rather than doing so by packet addresses they filter by specific protocol. Routers must use an inter-network protocol that is recognized by the attached LANs. Routers were born out of the necessity for dividing networks logically instead of physically. An IP router can divide a network into various subnets so that only traffic destined for particular IP addresses can pass between segments. The price paid for this type of intelligent forwarding and filtering is usually calculated in speed of the network. Such filtering takes more time than that exercised in a switch or bridge which only looks at the MAC layer. Brouters is a term sometimes used to describe devices which have both bridging and routing capability, however switches and bridges frequently have some router-like features such as selective protocol filtering.

Repeaters - are used to connect two or more Ethernet segments of any media type. As segments exceed their maximum number of nodes or maximum length, signal quality begins to deteriorate. Repeaters provide the signal amplification and retiming required to connect segments. Splitting a segment into two or more segments with a repeater allows a network to continue to grow.

Gateway - is a device that connects two or more dissimilar networks. A gateway performs complex functions such as interpreting between computers that speak different 'languages' through both protocol conversion and bandwidth conversion.

Appendix H
Glossary of Terms

GLOSSARY OF TERMS

Appletalk - A local area network developed by Apple Computer that can be used by both Apple and non-Apple computers for communication and sharing of resources such as printers and file servers.

Assistive Devices - Any item, piece of equipment or product system, whether acquired commercially off the shelf, modified, or customized that is used to increase, maintain or improve the functional capabilities of individuals with disabilities.

Asynchronous Transfer Mode (ATM) - A high bandwidth, controlled-delay fixed-size packet switching and transmission system. ATM is also referred to as "cell relay".

Automated Circulation System - A library system in which some or all of the activities related to the loan of library materials is performed by computerized procedures.

Backbone - A high speed connection that links many networks.

Bandwidth - The range of transmission frequencies that a network can use. The greater the bandwidth, the greater the amount of information that can travel on the network at one time.

Bit - An element of a byte that can represent one of two values, on or off.

Broadband - A transmission method that occurs when the network's range of transmission frequencies is divided into separate channels, with each channel used to send a different signal.

Byte - Each storage location within main memory, identified by a memory address.

Central Processing Unit (CPU) - The unit that executes programmed instructions, performs the logical and arithmetic functions on data and controls input/output functions.

Coaxial Cable (COAX) - A transmission medium noted for its wide band width and it low susceptibility to interference. Signals are transmitted inside a fully enclosed environment - an outer conductor or screen which surrounds the inner conductor.

Compact Disk Read Only Memory (CD-ROM) - A prerecorded, non-erasable disc that can store over 650MB of digital data equal to 250,000 pages of text or 20,000 medium resolution images.

Compressed Video - Video and audio signals converted from regular analog signals to digital signals, making it possible for a network to carry more information.

Computer Applications - The use to which a processing system is put, such as word-processing and creating spreadsheets and mailing lists.

***Computer-Assisted Design** (CAD)* - A term applied to programs (and workstations) used in designing engineering, architectural, and scientific models ranging from simple tools to buildings, aircraft, integrated circuits, and molecules.

***Computer-Assisted Instruction** (CAI)* - A type of educational program designed to serve as a teaching tool. CAI programs use tutorials, drills, and questions-and-answer sessions to present a topic and to test the student's comprehension.

Computer Literacy - A functional working knowledge of a number of the generic tools, at a level consistent with one's overall education. Thus, as students increase the depth and breadth of their overall education, they are expected to grow in the breadth and depth of use of the generic computer tools.

Constructivism - The concept that learners construct their own knowledge. This idea was developed by Jean Piaget. It is part of the underlying theory of hands-on, discovery-based education. Many educators argue that computer-based learning environments are very supportive of constructivism.

Cooperative Learning - Students working and learning in pairs or small groups. Each student actively contributes to the learning process. This type of instruction lends itself to developing communication, cooperation, problem solving, and other skills that are used outside the classroom. Computer technology can play an important role as students work cooperatively on large, interdisciplinary, multimedia projects. With appropriate use of telecommunications, members of a team may be located in different schools, and even in different countries.

Curriculum Integration - The process of organizing curriculums to cut across subject matter lines to focus on broad areas of study.

Data Network - A communication system used for data transmission that has the potential to provide multiple access paths among users.

Desktop Publishing - Using a personal computer to produce high-quality printed output ready for commercial printing.

Distance Learning - An organized system of delivering educational information and materials between two or more geographically separate sites through a variety of transmission modes.

District Level WAN - A wide area network that spans a large geographical area, such as one that connects schools to the district and state office.

***Disk Operating System** (DOS)* - A single-user operating system for the PC.

DS3 - see T3

E-Mail - Messages that are sent electronically over telephone and computer networks that may be stored and read at the receiver's convenience.

Fiber Optics - A signal conducting medium that conveys light waves through transparent fiber. It allows high speed transfer of voice, video, and data.

File Transfer Protocol *(FTP)* - An Internet protocol that allows for files and programs to be moved or downloaded from one computer to a remote computer.

Frame Relay Cloud - A form of packet switching technology that allows for the transfer information at T- or 56K speed.

Full-Motion Video - A standard video signal for 30 frames per second and 525 horizontal lines per frame, which is capable of complete action.

Gigabyte *(Gb)* - A measurement of memory space equal to a billion bytes.

Gopher - Software which permits searching of files on the Internet or remote hosts using layered menus. Text from these files can be read on-line or transferred to a computer.

Graphical User Interface *(GUI)* - A graphics-based user interface that incorporates icons, pull-down menus and a mouse. Macintosh and Windows are examples.

Hardware - The physical components of a computer system, such as circuitry, keyboard, and display.

HyperCard - A hypermedia application development system from Apple. Using visual tools, the user builds stacks of cards that hold data with hypertext links between them.

Hypermedia - A computer can be used as the "glue" connecting *multimedia*. When this is done, the media can be used in an interactive, non-linear manner, and can include use of a full range of computer capabilities This is called hypermedia. Many schools now want all of their students to learn to create hypermedia and to use hypermedia as an aid to learning.

Hypertext - Linking related information. Selecting a word in a sentence, and retrieving information about that word, if it exists, or the next occurrence where the word is found.

Hypertext Markup Language *(HTML)* - A standard for defining hypertext links between documents.

Infrastructure - The basic facilities, equipment and installations needed for the functioning of a system.

Inquiry Based Learning - Method of learning in which students must seek information to solve

problems or to explain phenomenon they do not understand.

Interactive Media - A program that interacts with the user, who is usually (although not necessarily) sitting at a display of some sort and who is using some sort of input device to provide responses to the program.

Instructional Television Fixed Service *(ITFS)* - The specific band of microwave frequencies set aside by the FCC for educational use.

Internet - A large network made up of a number of smaller networks. The Internet is made up of thousands of interconnected networks around the world.

Laserdisc Player - A device that uses a laser to read information that has been encoded in a series of pits engraved in a video disk. It provides video and audio playback for prerecorded videodiscs.

Life-Long Learning - A term which signifies the organizational and didactic structures and strategies that permit learning to take place from infancy throughout adulthood.

Liquid Crystal Display *(LCD)* - A display technology that uses rod-shaped molecules that flow like liquid and bend light.

LCD Panel - Also called a projection panel, it is a data projector that accepts computer output and displays it on a see-through liquid crystal screen that is placed on top of an overhead projector.

Local Area Network *(LAN)* - The linkage of computers and/or peripherals in a limited area, usually less than two miles, that allows users to communicate and share information.

Megabyte *(Mb)* - A measure of memory equal to one million bytes.

Megahertz *(MHZ)* - One million cycles per second.

Microwave Transmission - Sending high frequency radio waves from a tower at one point through the air to a receiving dish at another site.

Mouse - An electronic device that controls movement of a cursor on a video display, terminal, or monitor, when the user by hand rolls the device along a flat surface.

Modulator-Demodulator *(Modem)* - A device that adapts a terminal or computer to atelephone line.

Multimedia Many different types of media, such as slides, movies, audio tape, video tape, CD-ROMs, and laser discs can be used to store and present information. Any use of a combination of two or more media is called multimedia. See also: hypermedia.

On-Line - Establishing a connection with another computer via telephone lines or through a network.

Portfolio - A collection of student work that is representative of what the student has learned throughout a given time period. The work can show what progress the student has made, or be a collection of the best work the student has completed. It reflects competence in authentic, on the job, tasks. Some parts of the portfolio may be in a hypermedia format; this is sometimes called an electronic portfolio.

Protocol - Rules governing transmitting and receiving data between computers and terminals.

Random Access Memory (RAM) - A storage device into which data can be entered and read. Information stored is lost when the computer's power is turned off.

Router - A device (sometimes a specialized computer) that stores addresses of network hosts and forwards packets of data between networks. For maximum access to the Internet's resources, a local area network needs its own router.

Scanner - A device that reads text, images and bar codes. Text and bar code scanners recognize printed fonts and bar codes and convert them into a digital code.

Site-based Management - A management structure in which the authority to make decisions is given to the people who have to implement the decisions and the people who are affected by the decisions.

Software - A program or set of instructions that tell a computer how to accept and manipulate data in order to turn it into information.

Sound Card - A personal computer expansion board that records and plays back sound, providing outputs directly to speakers or an external amplifier.

T1 - A digital transmission line that carries data at a rate of 1.544 Megabits per second.

T3 - A digital transmission line and carrier of 45 mbs bandwidth; one T3 channel can deliver 28 T1 channels or 672 voice circuits used for digital video transmission or for major PBX-PBX telephone interconnection.

Teacher Productivity - The amount of work a teacher is able to accomplish on anygiven day or week. The effort a teacher makes in lesson preparation, implementation, and evaluation will vary among individuals. Technology has the potential of making teachers more efficient in their efforts, thus more "productive."

Technology Coordinator - A specialist who interacts with classroom teachers, curriculum specialists, and school administrators to coordinate the instructional use of computers. Many school systems

have found that they need technology coordinators both at the individual school building level and for the entire school district.

Telecommunications - The transfer of data from one location to another over communication lines.

Telecomputing - A subset of telecommunications, which is the process of communicating electronically from one place to another. Telecomputing is a more specific term referring to computers communicating electronically, mainly over telephone lines.

Teleconferencing - Simultaneous visual and/or sound interconnection using telecommunications links that allow individuals in remote locations to see and communicate with each other in a conference arrangement.

Telnet - An Internet service that allows users to log on to remote host computers as "guest" users, providing access to the files as if they were actually at the host site.

Token Ring - A standard network architecture in which a ring topology is passes sequentially from station to station to prevent collision. Only that station processing the token can communicate on the network.

Transmission Control Protocol/Internet Protocol *(TCP/IP)* - A set of computer commands that dictate how the computers on the Internet will communicate with each other.

Two-way Video and Audio - The ability to transmit and receive pictures and sound simultaneously in real time.

Upgrade - The process of changing to a newer, usually more power version of a computer system or component.

Uplink - a satellite dish that transmits signals up to a satellite. These signals are then sent back to Earth to a downlink (receiving) site.

Video Conferencing - A form of teleconferencing where participants see and hear other participants in remote locations. Video cameras, monitors, codecs, and networks allow synchronous communication between sites.

Wide Area Network *(WAN)* - A computer network in which widely dispersed computers, such as those among several buildings or across a city or state, are interconnected. WANs make use of a variety of transmission media, which can be provided on a leased or dial-up basis.

Wireless - Voice, date, or video communications without the use of connecting wires. In wireless communications, radio signals make use of microwave towers or satellites. Cellular telephones and

pagers are examples of wireless communications.

***World Wide Web** (WWW)* - A hypermedia information retrieval system linking a variety of Internet-accessible documents and data files (text and graphics). Often referred to as "the Web."

Acronyms

ADA - Average Daily Attendance
ISTE - International Society for Technology in Education
PBS - Public Broadcast System
SMTP - Simple mail Transfer Protocol
UTP - Unshielded Twisted Pair
VSAT - Very Small Aperture Terminal

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U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement (OERI)
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